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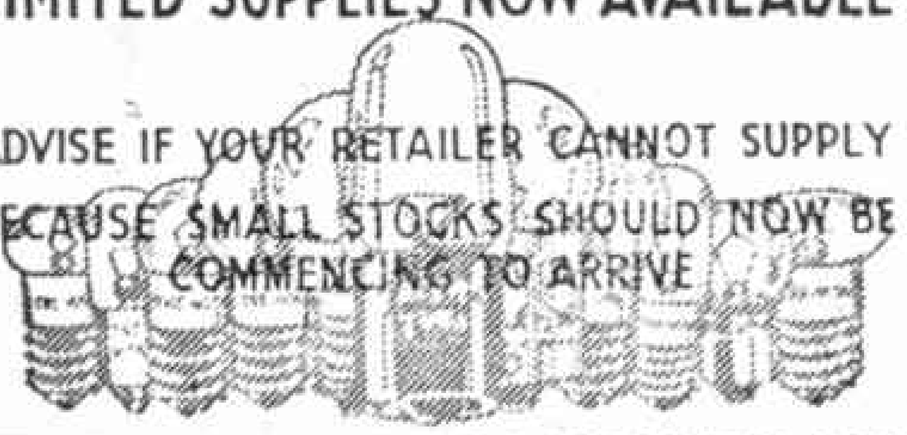

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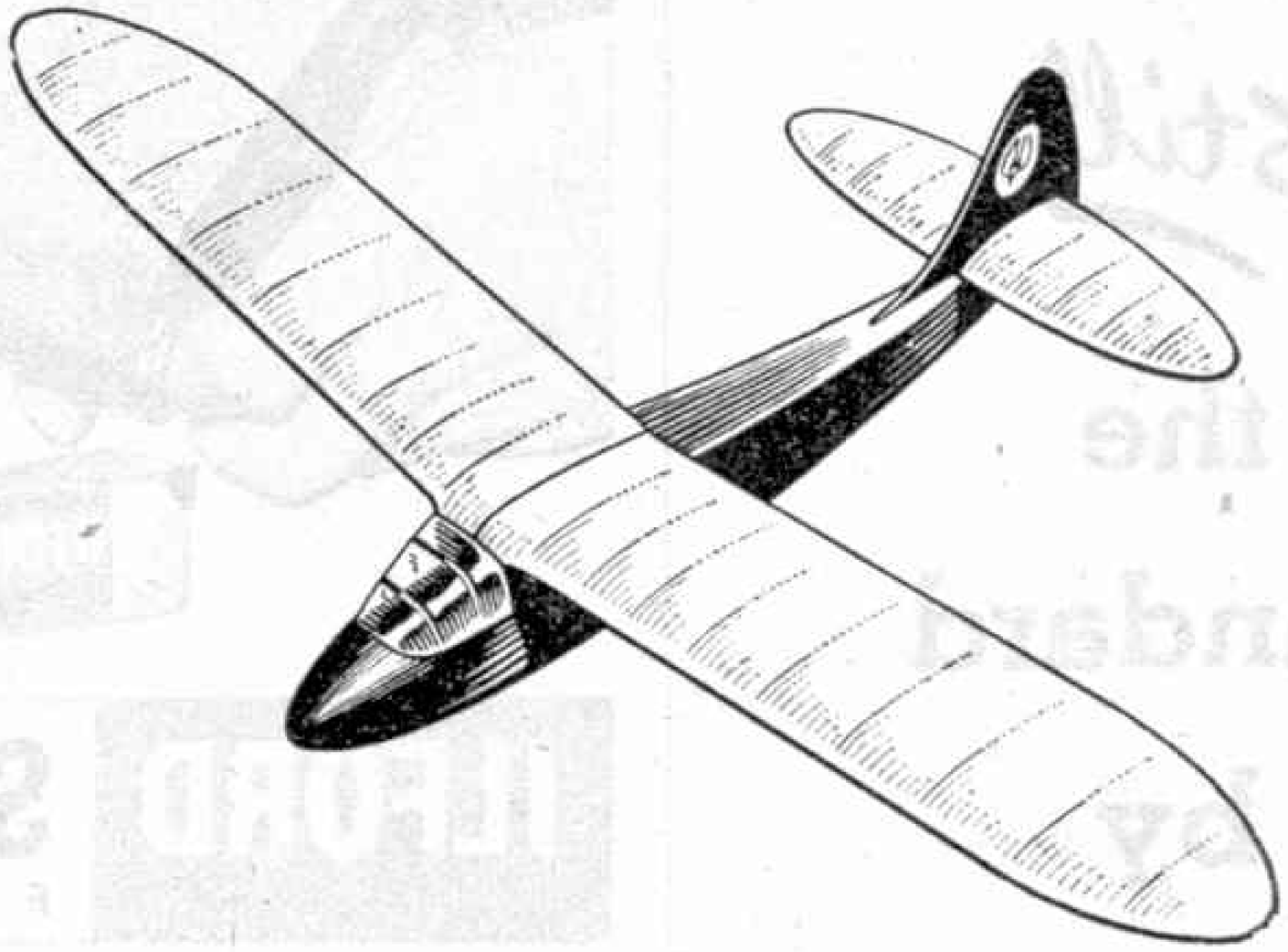

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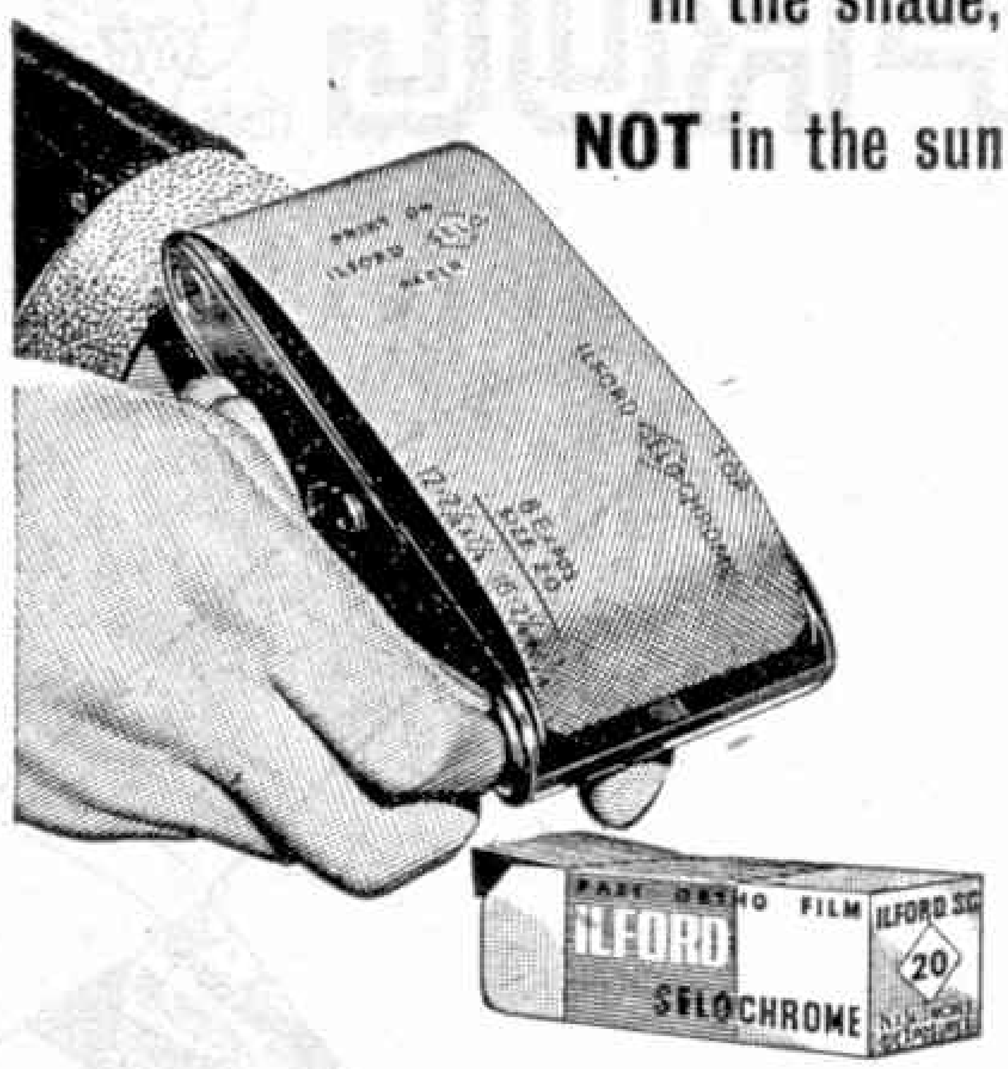

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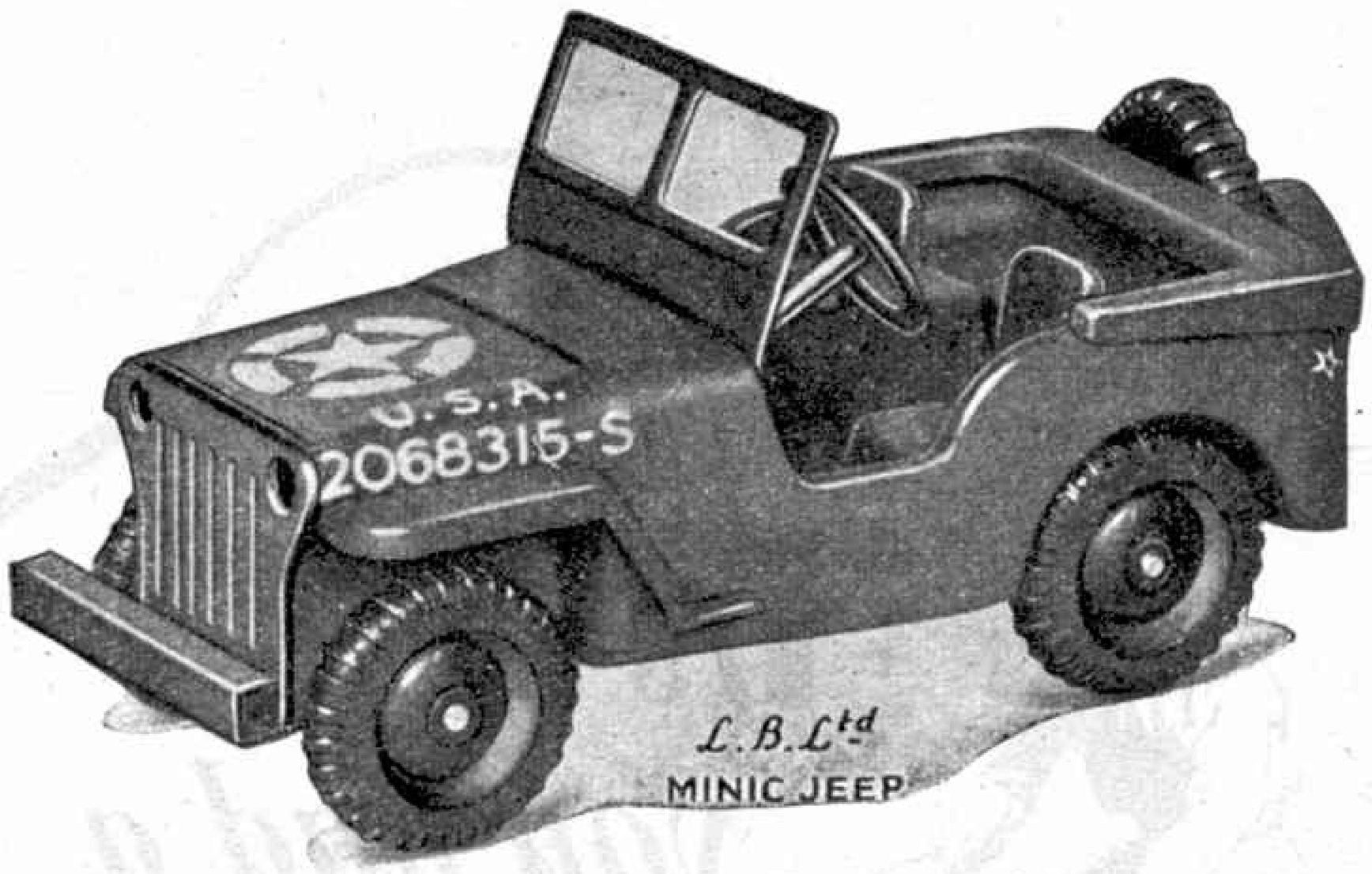

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Next Month: "TAILLESS AIRCRAFT." By J. W. R. Taylor

MECCANO MAGAZINE

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With the Editor

The Return of the Liners

The great liners are returning to the Atlantic and other ocean highways. They have not lost any of their interest and romance, even if in future their great work of carrying passengers and freight around the world has to be shared with the giant air liners, British and American, that we already have in use or are promised. There is special interest in the coming appearance in service of the *"Queen Elizabeth."* This mighty vessel, the largest ever built, was completed in wartime, and then slipped secretly across the Atlantic ocean to join the *"Queen Mary"* in war service. Now she has been overhauled and is being re-fitted at Southampton, in preparation for the service for which she and the *"Queen Mary"* were designed, the Atlantic ferry.

On the North Atlantic there will be "Empresses" as well as "Queens," for two of the vessels of the Canadian Pacific Steamships pre-war fleet are being re-modelled to improve the standard of accommodation they provide. These are the former *"Duchess of Richmond"* and *"Duchess of Bedford,"* two of the fleet of four "Duchesses" that before the war sailed between Liverpool and the Canadian ports of Montreal and St. John, the latter of which was used in winter, when the St. Lawrence was frozen.

Two "Duchesses" were sunk during the war, and the two that have survived are to become the *"Empress of Canada"* and the *"Empress of India"* respectively. The former *"Empress of Canada"* was sunk during the war, and the original *"Empress of India"* was sold to become a hospital ship. Both vessels served in the Pacific Ocean before the outbreak of war.

The extent of the re-modelling of the 20,000-ton "Duchesses" justifies their elevation to "Empresses," for a pair of rooms in an old "Duchess" will become one room in an "Empress," and there will be more and better provision for recreation and enjoyment.

Voyages across the narrow seas also will have a new interest because of splendid vessels built for these services. The *"King Orry"* and *"Mona's Queen,"* each of 3,000 tons and with a speed of 21 knots, are already crossing between Liverpool and the Isle of Man, and these vessels too set a new record in equipment and passenger accommodation.

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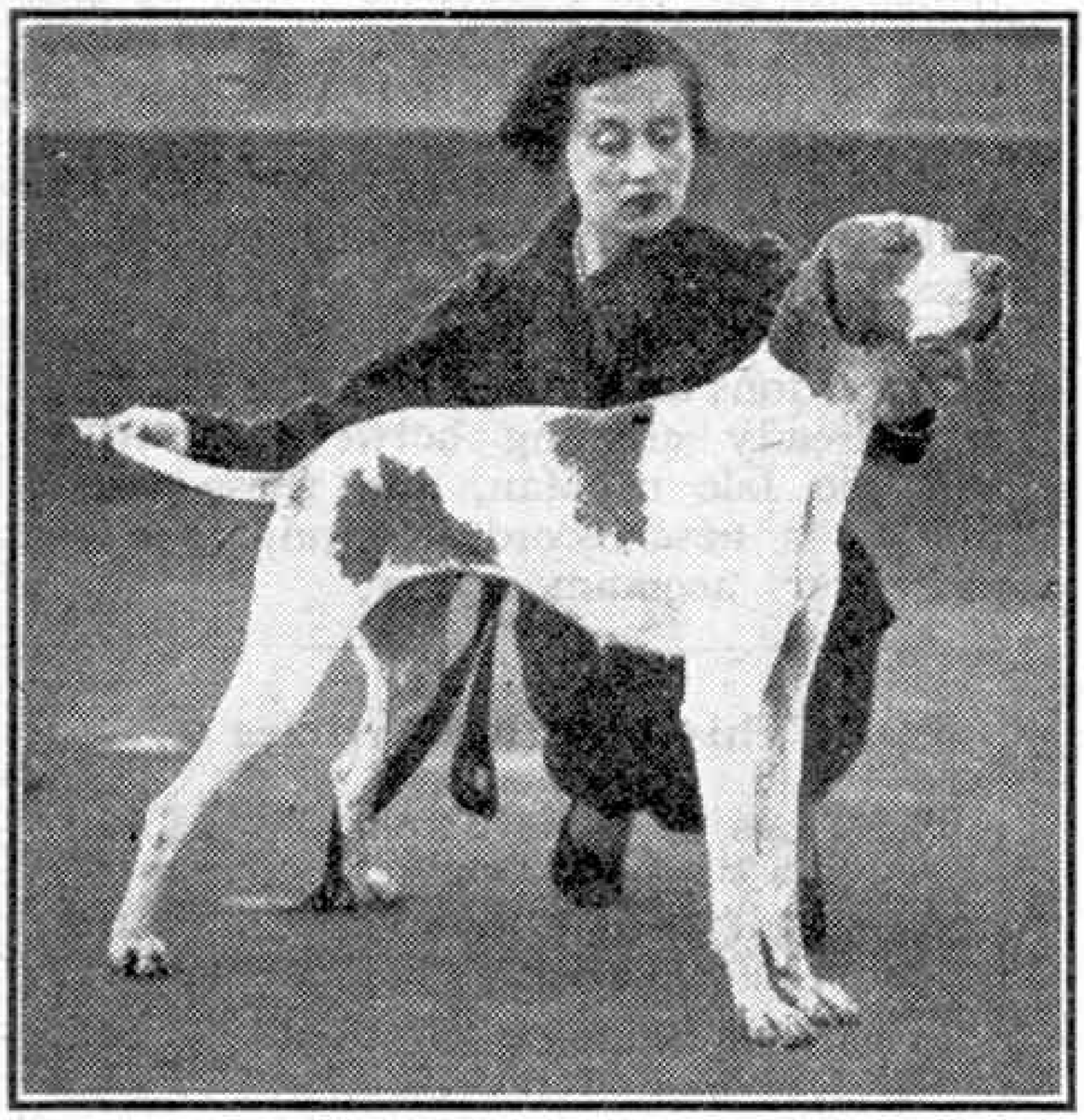
The Dogs of "The Twelfth"

By Lola Macdonald Daly

(The famous gundog authority and international judge)

IN the Louvre, before the war, there hung a painting by Jean Baptiste Oudry, showing a Pointer dog at work. Below was an inscription which told us this was the Chien de la Meute (the dog of the field) of Louis XV. And for all the change there has been in the looks of the breed, this Pointer of the early 18th century might well be one of those over which, on the Twelfth of August, time-honoured



Mrs. L. Macdonald Daly with one of her famous pointers "Stainton Sonora."

date for the opening of the grouse-shooting season, sportsmen of 1946 will be out again on the Scottish moors.

Just as the old fishing axiom has it, "If you want to see the fish, do not let him see you," so must the man who wants to shoot grouse always remember "If you want the birds to hear your gun, never let them hear your voice." For centuries we have employed dogs to find the birds for us—and what is more, find them without the need for shouted command.

We have trained the Pointer—who "points" his game, standing stock-still with tail extended, neck outthrust and forefoot raised the moment he finds it—and the Setter—who half-crouches, as if petrified, eyes bursting from his sockets, a tremor of excitement passing through his whole body.

Yet in our training we have done no more than bring to exaggerated perfection the instinctive pause that any hunting animal makes when he scents his prey. But with the pointing dog the instinct has been fostered to such an extent, first on the Continent and then in this country, that now it is something handed down from parent to puppy—one sees three-months-old Pointers pointing fixedly on chickens, untrained dogs turning to statues at their first whiff of game.

The Highlands of Scotland are the happiest hunting ground of the shooting man because it is there that grouse, which at certain seasons of the year live chiefly on young shoots of heather, are most abundant. Over the vast open spaces of the Highlands, the Pointer and the Setter continue to hold their own in an age when modern farming and modern fences have ended their usefulness farther south.

In a season of plentiful birds, the Pointer, steadier and less inclined to wildness than the Setter, is the better dog to use; if birds are scarce, the Setter, ranging farther and covering more ground, comes into his own.

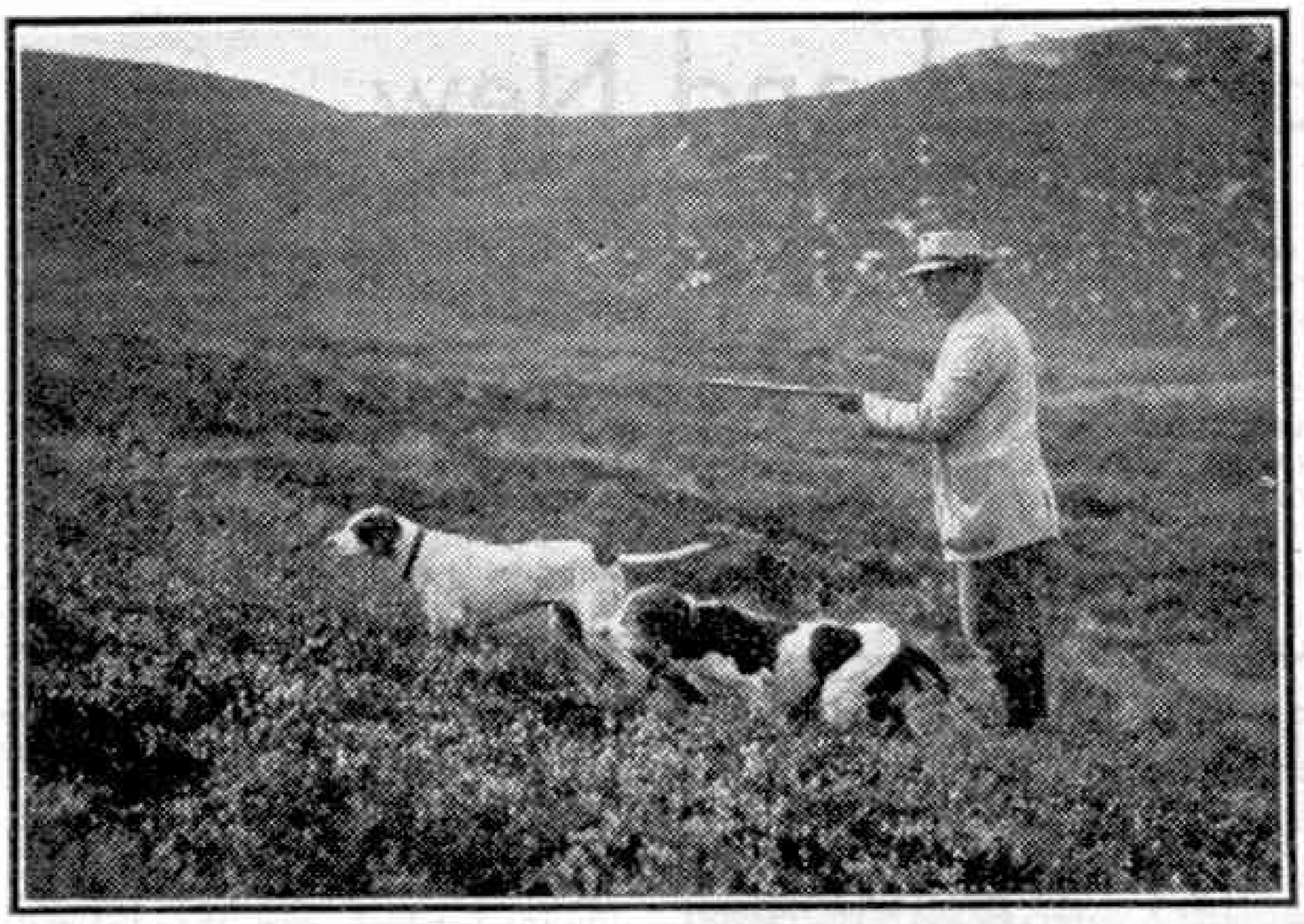
For months now gamekeepers—and the kennel-owners who hire out their dogs for the "Twelfth"—have been training their young stock. The gun-dog's education begins when he is six or seven months old. Stage by stage he is introduced to:

The Checkcord. This, attached to his collar, teaches him to restrain his instinct to rush towards pieces of food thrown to different corners of a room.

The Drop. Taught by pressing him to the ground with one hand while raising the other and commanding him to "Down" or "Drop."

Ranging. This encourages his desire to hunt and at the same time sees that he does it under control, swinging to and fro in a figure-eight in front of his master.

Avoiding gunshyness. This I used to do by firing a blank cartridge in a small pistol, just before the puppies were fed (in much the same way that the cavalry regiments in India a century ago used to denote feeding time by firing a shot).



At work on the Moors.

Pointing. About 30 yards of strong cord is attached to the puppy's collar. When, in the midst of hunting his game, he is observed to become all excitement, indication that birds are at hand, the trainer moves in and takes hold of the loose end of cord. Steadying the pup with a gentle word of command, he puts a gentle pressure on the cord, just enough to prolong the instinctive pause of the dog to a "point." The trainer keeps him standing for two or three minutes, then commands him to "move in," and step by step, encouraging the infinite caution that comes naturally to the dog, moves up to the birds.

I always liked this stage of the training to take part on young partridge in July. For one thing, grouse have a stronger smell than partridge, and a dog trained on partridge will always find birds better when working on grouse; for another, young partridges stay clamped to the ground and do not take to wing, which avoids temptation for a chase by the puppy.

Actual shooting. Last lesson of all. The trainer urges his dog gently in, moves up to him, and fires a shot, at the same time giving him an order to drop. Soon the pup will be "dropping to shot" without the need for the accompanying command.

It is surprising how quickly you have the finished article, a dog that will range under perfect control away ahead of you, suddenly raise his head as a whiff of bird-smell comes to him on the breeze, point stiff and excited in the direction of his game, move in cautiously towards them, drop to his stomach as the birds rise in the air . . . . .

The object of the modern show judge of Pointer or Setter is to look for those qualities in anatomy which he knows are necessary to a dog in his work. For instance, the Pointer should have a foot shaped like that of a hare, an "expanding" foot, which will help to lessen shock during quick turns.

When I was in Australia, as judge at the Sydney Royal Show of 1939, I went quail shooting over Pointers, and in the vast paddocks, toiling along in the heat, I thought with envy of American quail-shooting—also conducted over Pointers, but on horseback.

Vast mileages are covered by dogs in the course of such a day's shooting, and though all four breeds, the Pointer, the Irish, Gordon and English setters, have their devotees as "best stayers," it is generally conceded that it is among Pointers you find the dogs "the longest day can't tire."

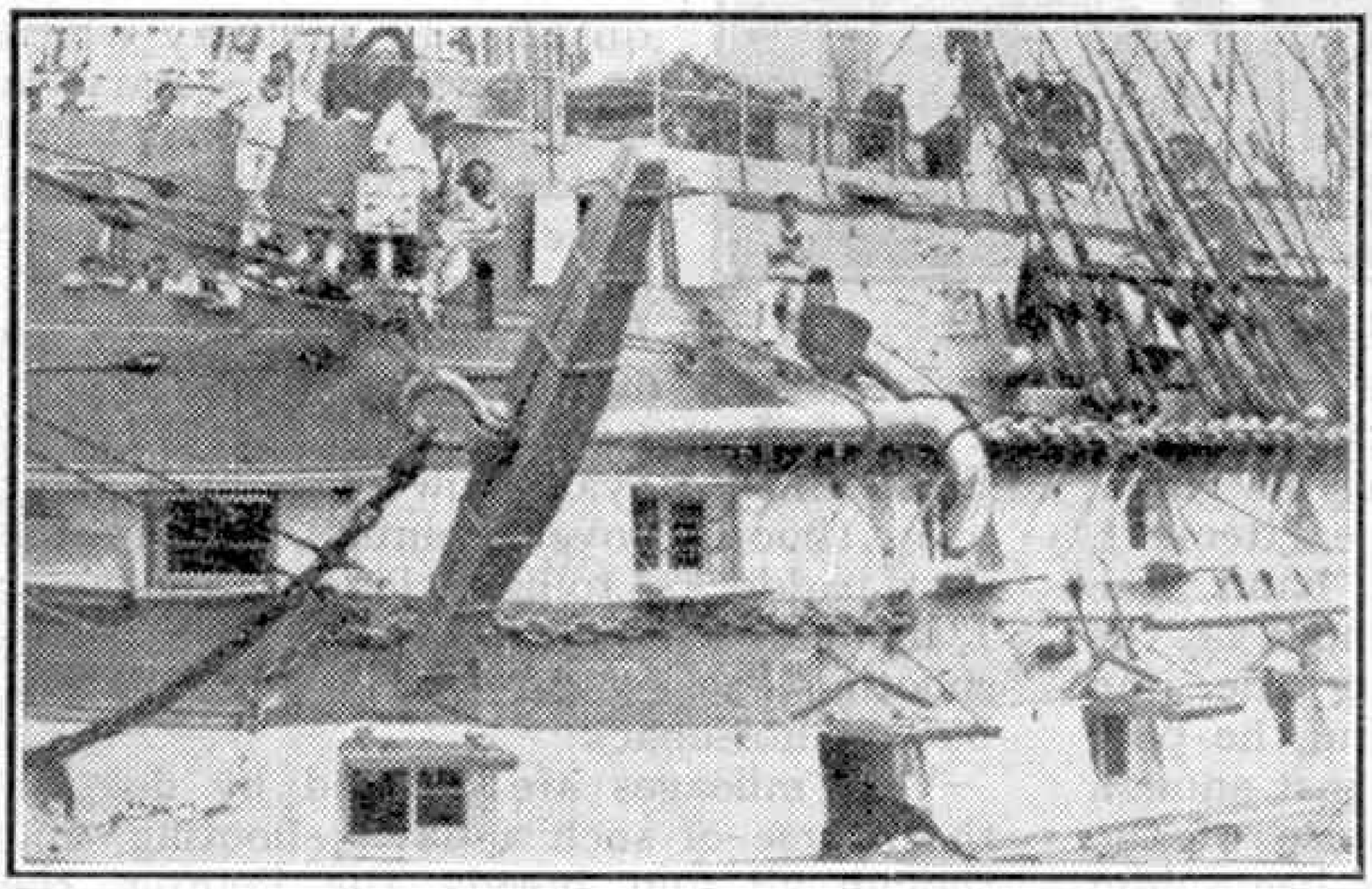
Many are the tales we all can tell of the time a dog will stand on point till his master joins him. There is the classic, but, I fear, apocryphal story of the Pointer, working partridge, whose skeleton was found years later, still on point, with the skeletons of a brace of partridge in front of him!

"The perfect point."

Anchors Old and New

By Frank C. Bowen

THERE is probably no item of a ship's furniture better known to the landsman than the anchor, but even professional seamen know comparatively little about its development from the ancient killick, which is still one of the seaman's terms for it. In the early days, no doubt, a convenient stone was used to hold ships fast, but that developed into the killick, which was the forked bough of a tree with a heavy stone lashed into the angle to give weight and a rope made fast to one end. As early as 600 B.C. the single hooked metal anchor which the ancient Greek navigators had used began to be replaced by the double hooked type, and chain cable was occasionally used; in Caesar's day chain cable, bronze in some parts of the Mediterranean and iron in the Channel, was general, but at some later date it disappeared for centuries and only hemp was used.



The old "Admiralty" type anchor with its huge built-up wooden stock, lashed to the side of a line-of-battleship.

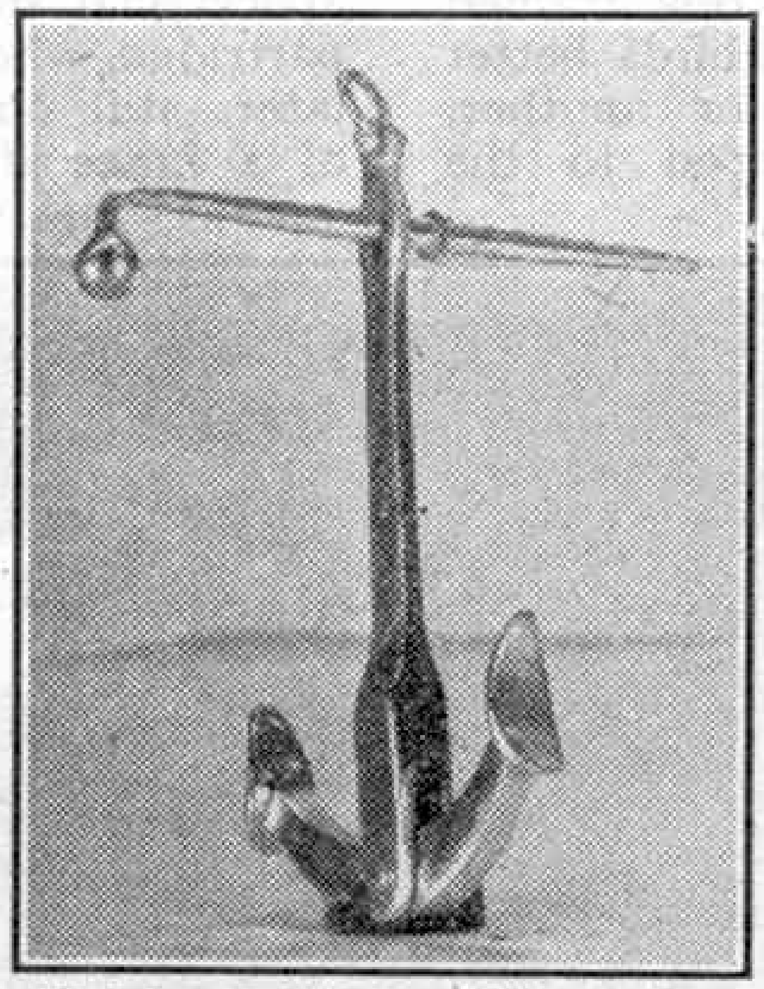
Many people are apt to doubt St. Paul's account of his shipwreck in A.D. 60, and to think that he got mixed up with his technical terms, but there is no doubt that the Roman ships of his day were built very high aft on account of the age-old fear of being pooped by a following sea, so that it was quite natural to cast four anchors over the stern.

Our knowledge of mediæval practice is mostly through coins and inventories, by which we know that the big ships of Richard I's Crusades carried anchors 7 ft. long, and that in the Middle Ages many different types were used although practically all had a stock, shank and curved arms. In Henry IV's day the bigger units carried "ship anchors" while small craft had grapnels; the number of spares that they carried is an indication of how easily they were lost.

The familiar type of "Admiralty" anchor, as it is still called, was popular for centuries and was known in Columbus' time at least, possibly considerably before. A wooden stick pushed through a hole in the end of the shank was certainly much earlier, always set at right angles to the flukes and made longer than they were, so that it would always cant the anchor and bring one of the flukes downwards. Probably the single stick grew into the massive wooden stock, built up and secured by iron bands or rope lashings, with the increase in the size of ships during the fifteenth century. Soon they had become so big and heavy that it was impossible for a small crew to bring them inboard, and they were lashed to the side of the ship.

In the early part of the seventeenth century the proportions of British warships' anchors were definitely fixed, the shank being three times as long as the length of one of the flukes plus half the "beam," which was the distance from tip to tip of the flukes. The fluke was generally half the length of the arm, shaped as an equilateral triangle for years before the spade became the fashion. The arms were either the arc of a circle or straight, and the stock could be the same length or rather more than the shank.

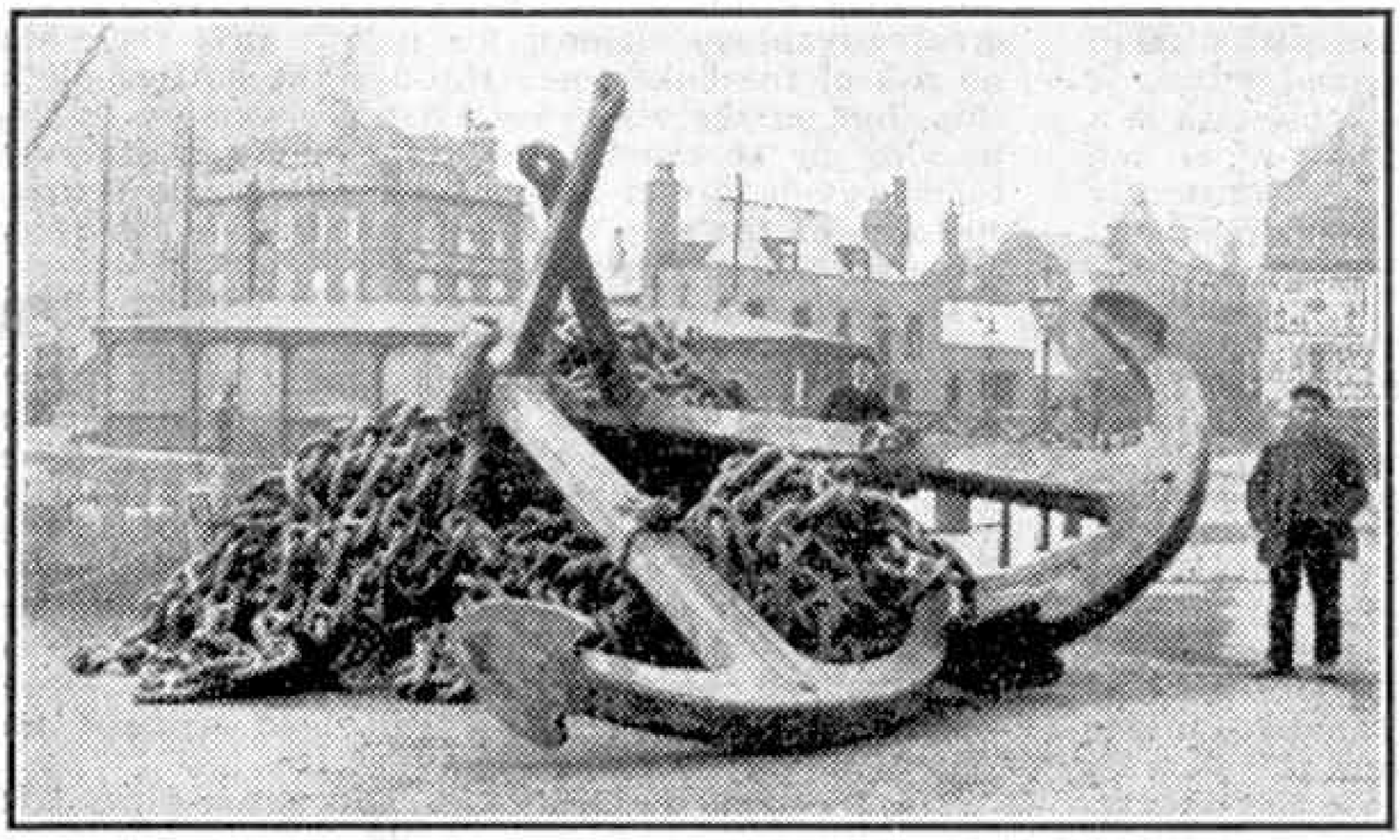
By that time the King's ships were carrying an extraordinary number; the "*Great Harry*" of 1514 had, stowed ready for use, a sheet anchor, four bower anchors, and four destrells, or spare bowers, as well as a cagger or kedge with a spare of each in case they were lost. The bowers were the ordinary working anchors and got their name from their place in the bows of the ship; the sheet was the last reserve and how the name originated is a matter of discussion. In very early manuscripts it was generally written "shut" or "shott," which does not help much; the suggestion that it came from being shot overboard is attractive but very doubtful. The origin of the name "destrells" is still more of a mystery, for no plausible theories have even been suggested; while the period when the term "Admiralty anchor" was first used is equally unknown.



Model of "Trotman's" anchor. This model and the two on the opposite page were kindly lent by Bassett-Lowke Ltd.

For centuries the sailor's greatest anxiety was on account of the hemp anchor cables. They not only occupied a colossal space in the hold of the ship, at the expense of water and stores, but were constantly parting by friction against the rocky bottom, deteriorated rapidly through alternate wetting and drying, and could be smelt all over the ship. In the late sixteen hundreds cable was always supplied in lengths of 100 fathoms, which is still the "cable's length" used for measuring short distances at sea.

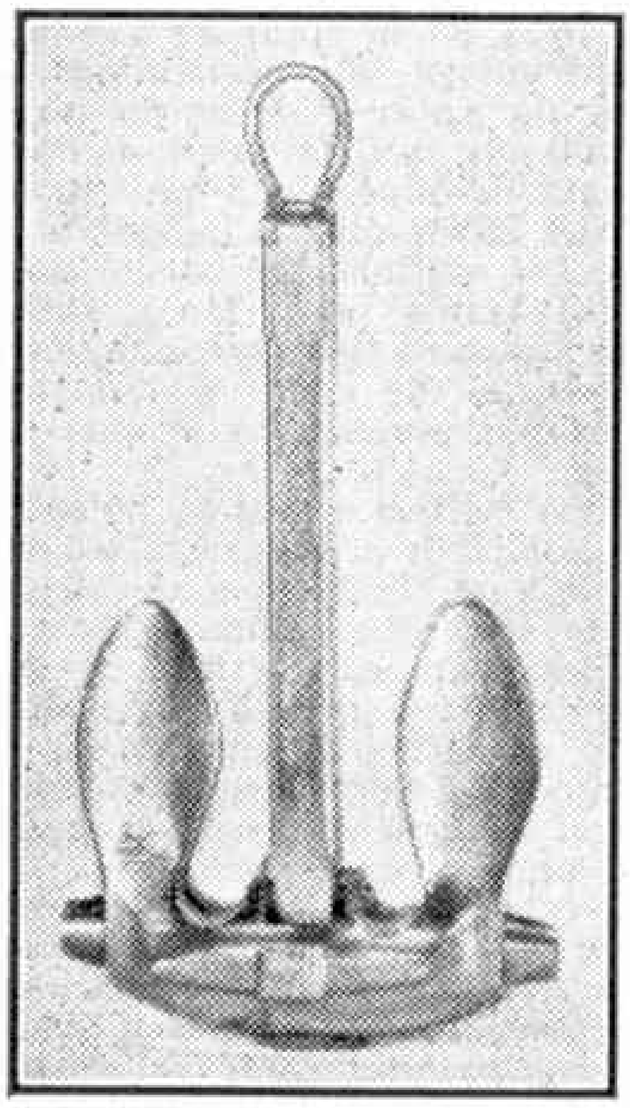
A big hemp cable, up to 15 in. in circumference, would obviously not go round the barrel of a windlass, so that an endless rope known as a "messenger" was rigged round the windlass, which was generally placed amidships, and a wheel forward. As the



The huge stocked anchors of the German sailing ship "Preussen," the biggest sailing ship of her day.

cable came in over the bows it was quickly lashed to the messenger by "nippers" of light rope which were cast off again as they came to the windlass and the pipe leading to the cable tier. This lashing and casting off, while the cable was moving all the time, naturally demanded smartness, and the best boys in the ship's company came to be known as "nippers." That is one of the many sea phrases which have come ashore.

Hemp was such an unmitigated nuisance that many efforts were made to replace it by chain, as in Roman days, in the latter part of the eighteenth century. It was not, however, until 1808 that Lieutenant Samuel Brown, R.N., devised a satisfactory method of making it reliable. The Navy put the chains through some thorough tests and adopted them for general use, although the old unreliable hemp was still retained as a reserve for some years, and in 1813 they were also taken up by the best merchant ships. The safety of a sailing ship depended so much on her anchors that precautions were taken, and in 1816 the letters "P.I.C." were stamped into the links which had been proved. Twelve years later Lloyd's Register issued minute instructions to their surveyors but, having proved its reliability, chain cable was bought by many shipowners without any precautions.



Model of "Byers'" stockless anchor.

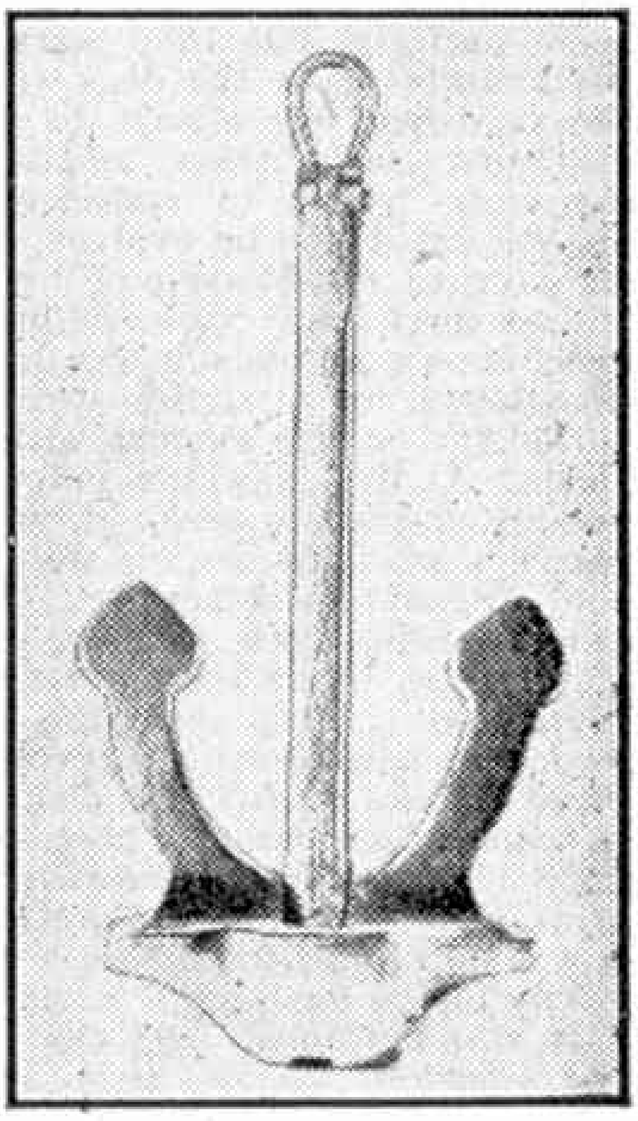
In some parts of the Midlands it was the custom to get the links made by piece-work, generally in the back gardens of the workers, and this resulted in so many ships being lost through their cables parting that the Cable and Anchors Act of 1864 laid down proper precautions and tests. Until the piece-work system had been adopted British anchors had a higher reputation than any in the world and were bought by careful shipowners of all nations; that reputation was finally regained but it took a long time.

The adoption of chain cable permitted improvements in the traditional shape of the anchor, as it was not nearly so liable to foul the anchor if a reasonably long scope of cable were paid out. The long shank was no longer necessary and the weight saved was put into heavier and stronger crowns. Between 1820 and 1875 something like 130 different patents were registered for anchors, a large number of them quite impractical although some of the early types have lasted to this day. The first change was the substitution of an iron stock for the old built and hooped wooden one.

The next real advance was the invention of the first Trotman anchor, then called the "tumbling fluke anchor," by Lieutenant Belcher, R.N., in 1818. It was forged in two separate parts, arms and shank, connected by a pin which passed through a fork at the end of the shank, which was rectangular. The arms pivoted this pin so that when one fluke was buried the other pressed against the shank and greatly reduced the risk of fouling. It soon became popular and was a great advance in many respects, but its holding powers were doubted as compared with the old "Admiralty" pattern, and a commission which was appointed by the Admiralty to consider the matter in 1838 reported in favour of the old type, which therefore continued in use in the Navy for another twenty odd years.

Captain Rodgers, R.N., brought out the anchor known by his name in 1840, after taking out a number of patents. It was made of iron and very strong. In the early type he made the palms of the flukes very small for penetration but he soon came into line with other inventors and enlarged them to give better holding power. In 1841 the Parker type was introduced by Sir William Parker and was very popular for a number of years; its shanks and arms were elliptical. Captain Hall's anchor was designed for use as a kedge; it was made in two parts so that if a ship ran ashore her boats could carry the two halves separately where the weight of a single anchor would be too great for one boat. It was ingenious but lost a lot of strength. The Great Exhibition in Hyde Park in 1851 had quite a big section devoted to anchors and aroused so much attention that the Admiralty set up another committee in 1852 to consider them all and carry out practical tests. The Trotman anchor, considerably improved since its first patent, was given the first place and the Rodgers anchor second.

All these types, however, had to be stowed either on deck or against the side of the ship. This was always laborious, but while



Model of "Dreadnought" anchor used for battleships and other large vessels.

it was of no great disadvantage in a man-of-war with her big crew, the job of catting the anchor with a small crane or derrick on the forecastle head, and getting it into position and properly secured, was a big task in a sailing ship. Practically all their hawse-pipes ran directly into the forecastle, which was constantly flooded out while the ship was in soundings and had to have her anchors ready for immediate use. As soon as she was in deep water they were unshackled from the cable, which was drawn inboard, and the hawse-pipes were plugged with wood. These plugs were never watertight and their leaking always made the forecastle uncomfortable for the crew.

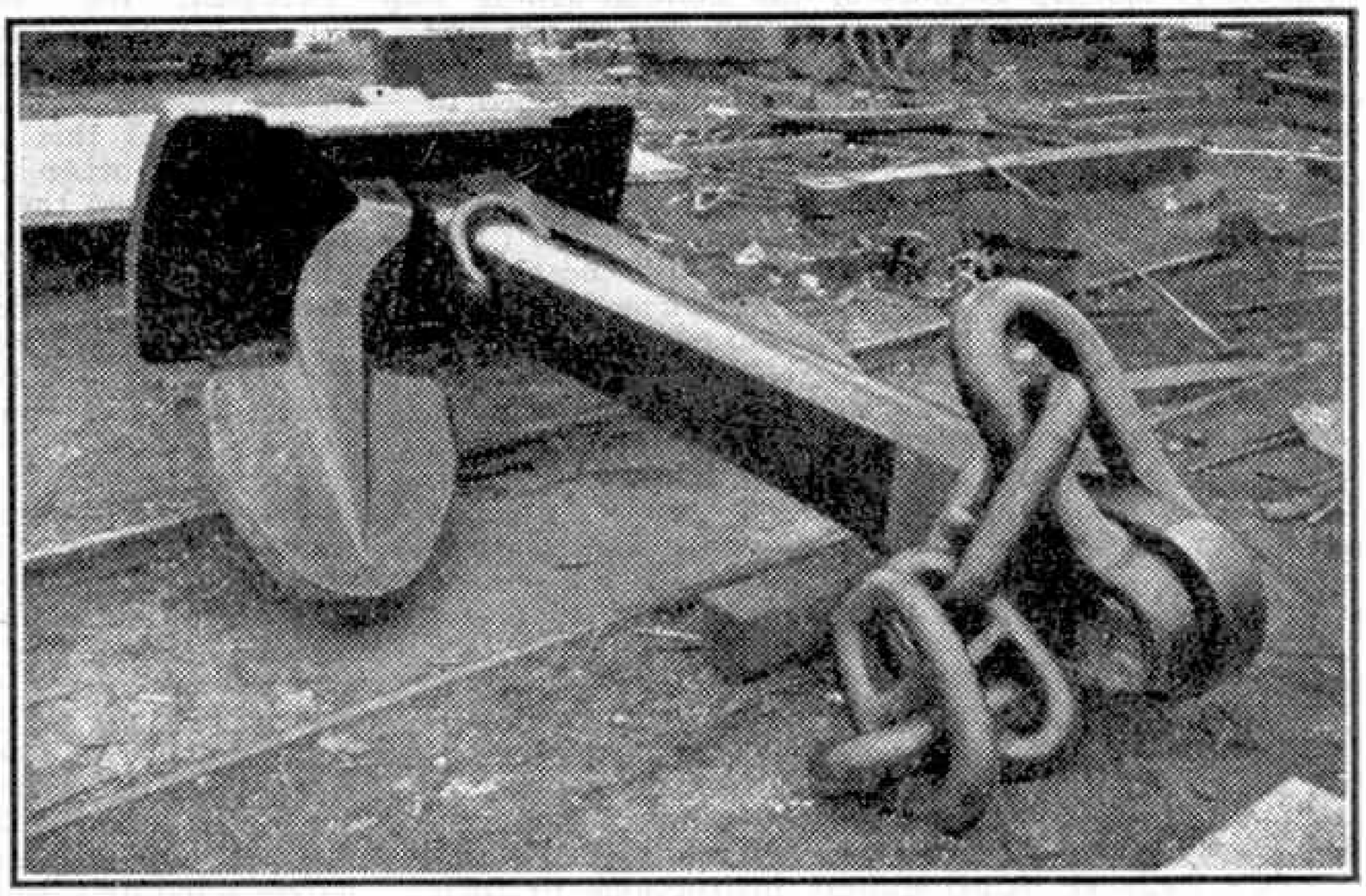
When the cables were unshackled the anchors were stowed on the forecastle head and securely lashed down. One of the traditional stories of the sea was of the clipper "*Loch Tay*" which was in mid-Atlantic when the second mate had to go aft to report to an astonished captain that he had lost both anchors in mid-ocean. What had happened was that advantage was being taken of a calm day to caulk the deck on the forecastle head, and for that purpose the lashings of the anchors were cast off so that the men could get at the deck under them. But the ship took two totally unexpected rolls and jettisoned an anchor over either bow. It was an accident that might happen quite easily, but it meant a new second mate when she got to Australia.

The invention of the steam hammer in 1842 made the welding of heavy masses of iron quite easy, without any suggestion of unreliability, and the rapid growth of the size of ships soon afterwards, demanding heavier ground tackle, took advantage of this. But the heavier the anchor the more difficult it was to weigh by hand and stow inboard. Steamers, being able to relieve the strain on their cables by keeping their screws or paddles working, did not demand such heavy anchors as the sailing ships which had to rely on them entirely, but they were quite heavy enough, particularly when the deck crews were reduced. So the tendency was always to find lighter anchors of improved construction, and it was not long before inventors began to consider whether a stockless anchor could not be evolved, which could be pulled right up to the hawse-pipe by a steam windlass and stowed there quite comfortably. Stockless anchors had been known in the fourteenth century but had been abandoned for centuries because of their tendency to lie flat on the bottom without the stock to cant them. A Mr. Hawkins patented one in 1823 but nobody wanted to adopt it, and it was not until the Martin's stockless anchor was patented in 1854 that they began to win support. Many types have been patented since then, differing in detail but practically all of them based on the Martin patent, which was of the self-canting type, the arms and crown being forged in one piece and revolving through an angle of 30 degrees so that the flukes dug into the ground as soon as there was any horizontal strain on the cable. Its holding power was improved by the fact that both arms penetrated the sea bottom at the same time; it was impossible for the cable to foul it and it stowed neatly in the hawse-pipe against the ship's side.

It was not until 1898 that the Amiralty adopted the stockless anchor, H.M. cruiser "*Psyche*" being fitted with one as an experiment. Until then the anchors had been catted and secured to a bed sloping down from the ship's deck so that they could be let go without difficulty, but the stockless type obviously reduced the trouble very greatly. One great advantage claimed for it was that there was no risk of the fluke going through the bottom of the ship, but on the other hand it was necessary to stop heaving in at exactly the right moment otherwise there was danger of bringing the hawse-pipe through the side of the ship or, more usually, wrenching off the arms and crown of the anchor.

Its fault was that the flukes were liable to break out of the ground when the ship swung round on the tide and reversed the pull, and it was generally admitted that the hold on a rocky bottom was not as good as in the old type. On that account, therefore, quite a number of ships carried a stockless anchor on one side and an old pattern stocked or Trotman on the other, a custom which is still followed by many of the small Dutch coasters, which call the stocked type their "Sunday anchor," as they can let it go and all row ashore for their Sunday relaxation with the certainty that it will hold without any attention.

The position of the anchors and hawse-pipes is of importance; if they are placed too low or at the wrong angle they may throw up a lot of spray as the ship pitches, always a disadvantage but particularly so in a man-of-war where the spray is liable to cloud the gunsights. To avoid this, and to avoid damage against dock or lock walls in ships which have to do a lot of canal work, the hawse-pipe is placed in a deep recess called a pocket, so that the anchor does not project beyond the ship's side. Many ships, particularly those using awkward tideways, nowadays have hawse-pipes placed in the stem of the ship and in the stern, with due precautions against its weakening the structure.



One of the "Queen Mary's" 16-ton anchors.

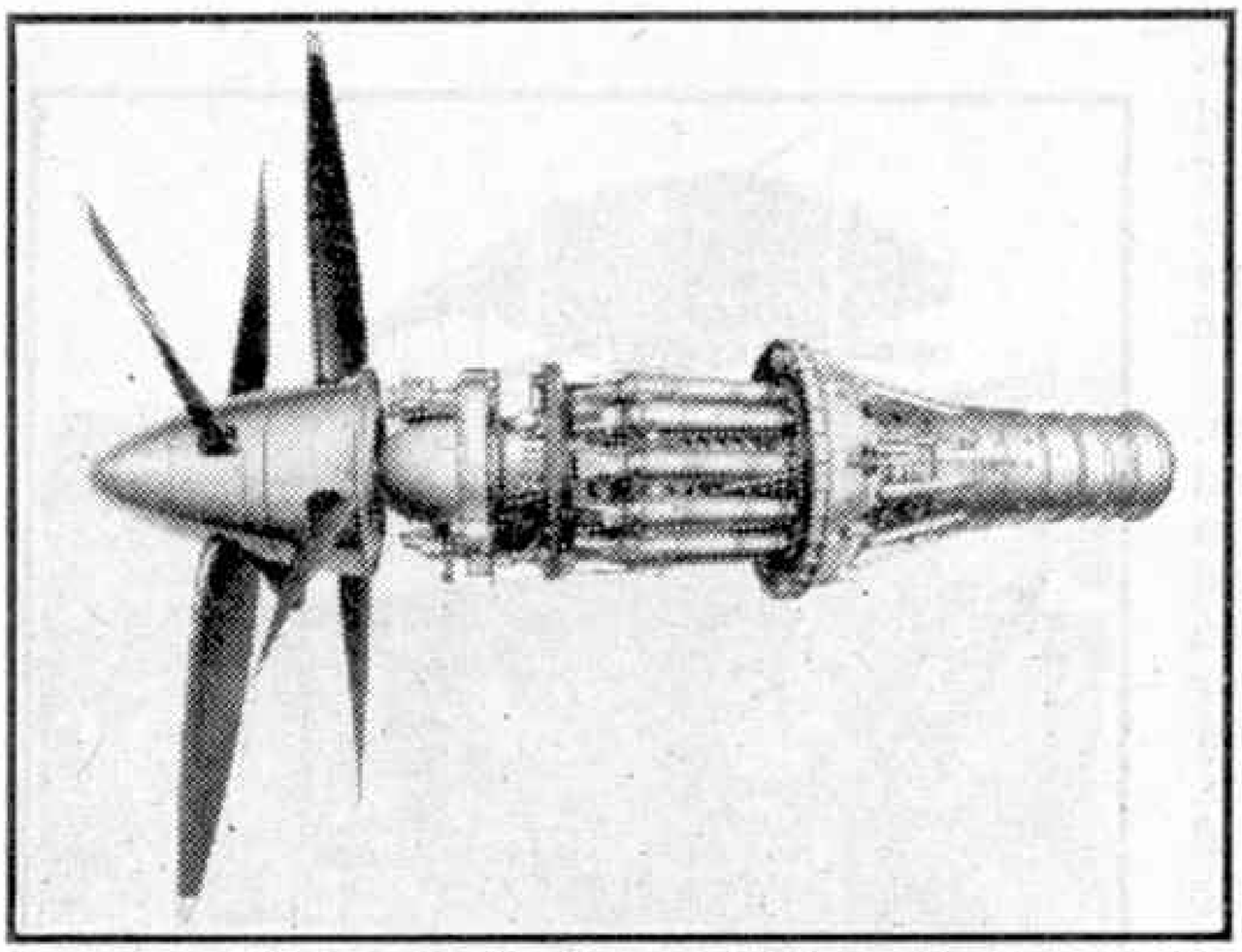
It has been realised for centuries that in order to give an anchor a good hold it is necessary to let out ample scope of cable, at least three times the depth of water; but it is only since the beginning of the war that scientific experiments carried out by the U.S. Coast Guard Service have proved that, with chain cable, the strain of lifting a long length of chain off the sea bottom holds a ship nearly as securely as the anchor itself, and many a ship has, in truth, ridden safely after the anchor has been lost.

During the recent war many novel anchors were introduced by the fighting services of all countries. Ships of various new types, aircraft, submarines, floating structures such as had never been seen before all wanted anchors of great holding power and usually demanded that they should be very light and should stow in the minimum of space. Among the most exacting demands were those of the landing crafts.

The Armstrong-Siddeley "Python"

By John W. R. Taylor

THE fact that Britain still leads the world in jet-propulsion was shown most effectively when details were recently given of the new Rolls-Royce "Nene" and de Havilland "Ghost" jet engines. Each develops more than 5,000 lb. of thrust, which is equivalent to about 12,000 h.p. and makes them the most powerful aero engines in the world. But these pure jet engines use up an awful lot of fuel, and while this is not so bad when they are fitted to fighters where high speed and rate-of-climb are essential, it does make them impractical for use in transport aircraft which need a long range.



Armstrong-Siddeley "Python" gas turbine, showing, in the centre, the combustion chambers grouped round the compressor casing.

The answer to this problem of combining high speed and long range is the gas turbine—a jet engine driving ordinary propellers—and here again this country is ahead of all others. Outstanding in this class of engine is the new Armstrong-Siddeley "Python" which develops 4,300 h.p. at a speed of 300 m.p.h., making it ideal for use in the giant new air liners and flying-boats now being designed for Britain's airways.

It is no surprise that the "Python" has turned out so well, for Armstrong-Siddeley are world-famous as the manufacturers of high-class reliable motor cars and aero engines. They built their first "Puma" in-line engine in 1916, following it up with a series of radials of which the "Lynx," "Genet" and "Mongoose" are perhaps best known. Most of the aircraft used for five-bob joy rides at pre-war air circuses had Armstrong-Siddeley engines, and set up amazing records of reliability with a bare minimum of maintenance.

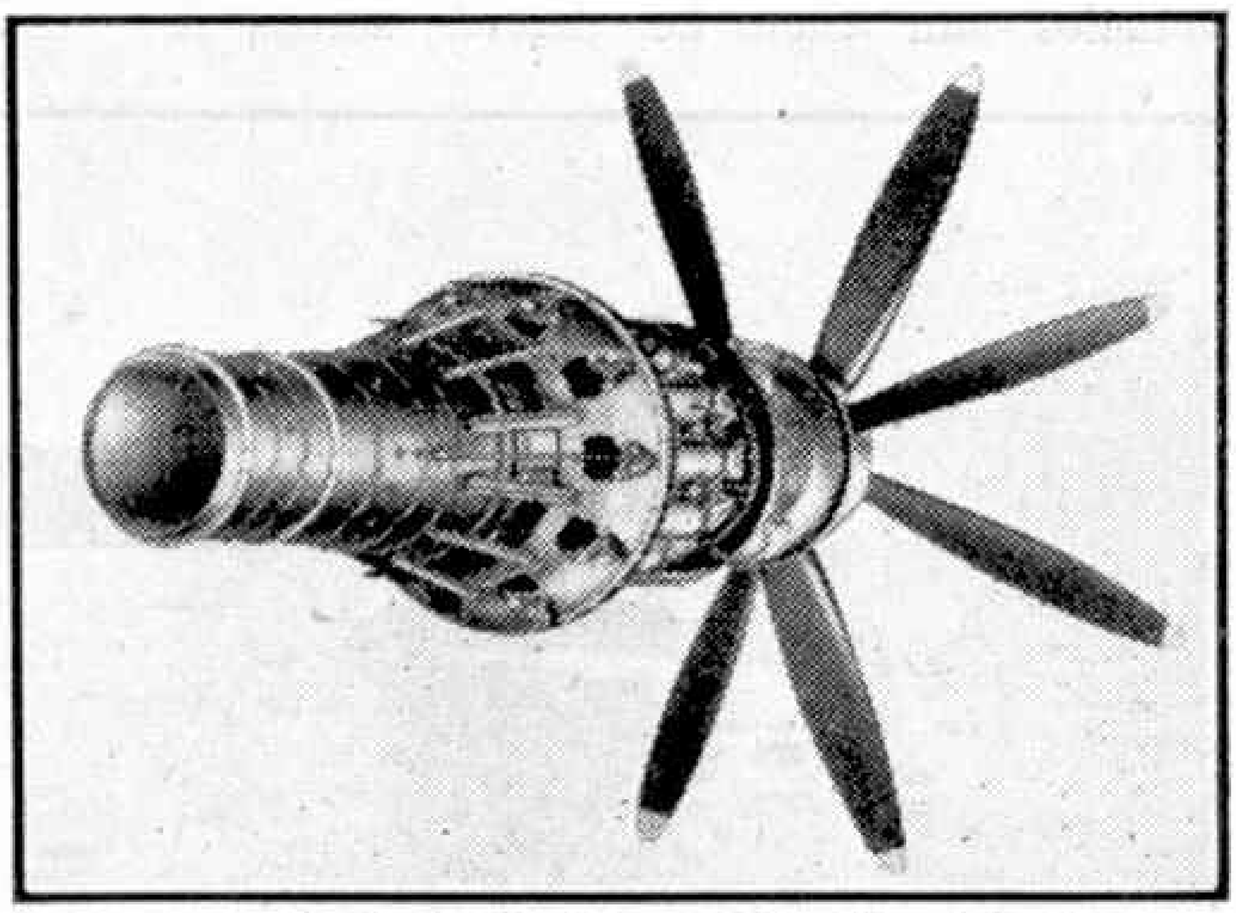
During the war years some 35,000 "Cheetah" engines were built to power the R.A.F.'s "Anson" and "Oxford" trainers. This brought Armstrong-Siddeley little glamour but a great deal of respect, for the "Cheetah" proved the world's most reliable engine, with a period of 1,250 flying hours between overhauls. Meanwhile the company's research engineers were looking far beyond the 475 h.p. of the "Cheetah," even beyond the new jet engines then being developed by other companies. These other engines were developed from the basic Whittle centrifugal compressor design; Armstrongs decided to adopt an axial-flow form of compressor of such a type that it could be later converted to drive airscrews. For the gas turbine seemed even then to offer the best chance of future air supremacy.

The first Armstrong-Siddeley pure jet engine, the "X," was built in 1942. It ran on the engine test bed for well over 1,000 hours and is still being flown experimentally in a converted "Lancaster." The "X" proved so promising, giving a thrust of 2,600 lb. for a weight of 1,900 lb., that it was decided to use it as the basis for a gas turbine. The result is the "Python." The engine is built round the compressor and its cylindrical housing. At one end of the housing is the main air intake, with a radial collector at the other end which has 11 "throats" leading into 11 combustion chambers grouped round the housing. These can be clearly seen in the illustrations. A second collector at the rear end of the combustion chambers leads into the turbine housing, from which the exhaust (or jet-thrust) nozzle extends rearward.

All these parts are fixed, and the principal moving components can be regarded as mounted on a common shaft. At the rear there is the two-stage turbine rotor, and forward of this the rotor of the 14-stage compressor. Right at the front of the shaft are two propeller shafts for the contra-rotating propellers, driven through a reduction gear.

The whole thing works as follows. Air is drawn in through the intakes by the compressor and passed on at high pressure via the radial collector into the combustion chambers, the direction of the airflow having been reversed by the collector. The fuel—Aviation Kerosene—is sprayed into the combustion chambers by special jets, and once its combustion has been started by means of an igniter plug the burning process is continuous. The resultant gases are caught by the rear collector and carried to the turbine which drives the propellers, after which they are exhausted through the rear nozzle, giving substantial extra jet thrust.

Armstrong-Siddeley are certainly to be congratulated on a fine contribution to British air supremacy.



Some of the 11 air intake "throats" leading into the combustion chambers can be seen in this view of the "Python."

Over the Sands by Tractor

A Quaint Devonshire Vehicle

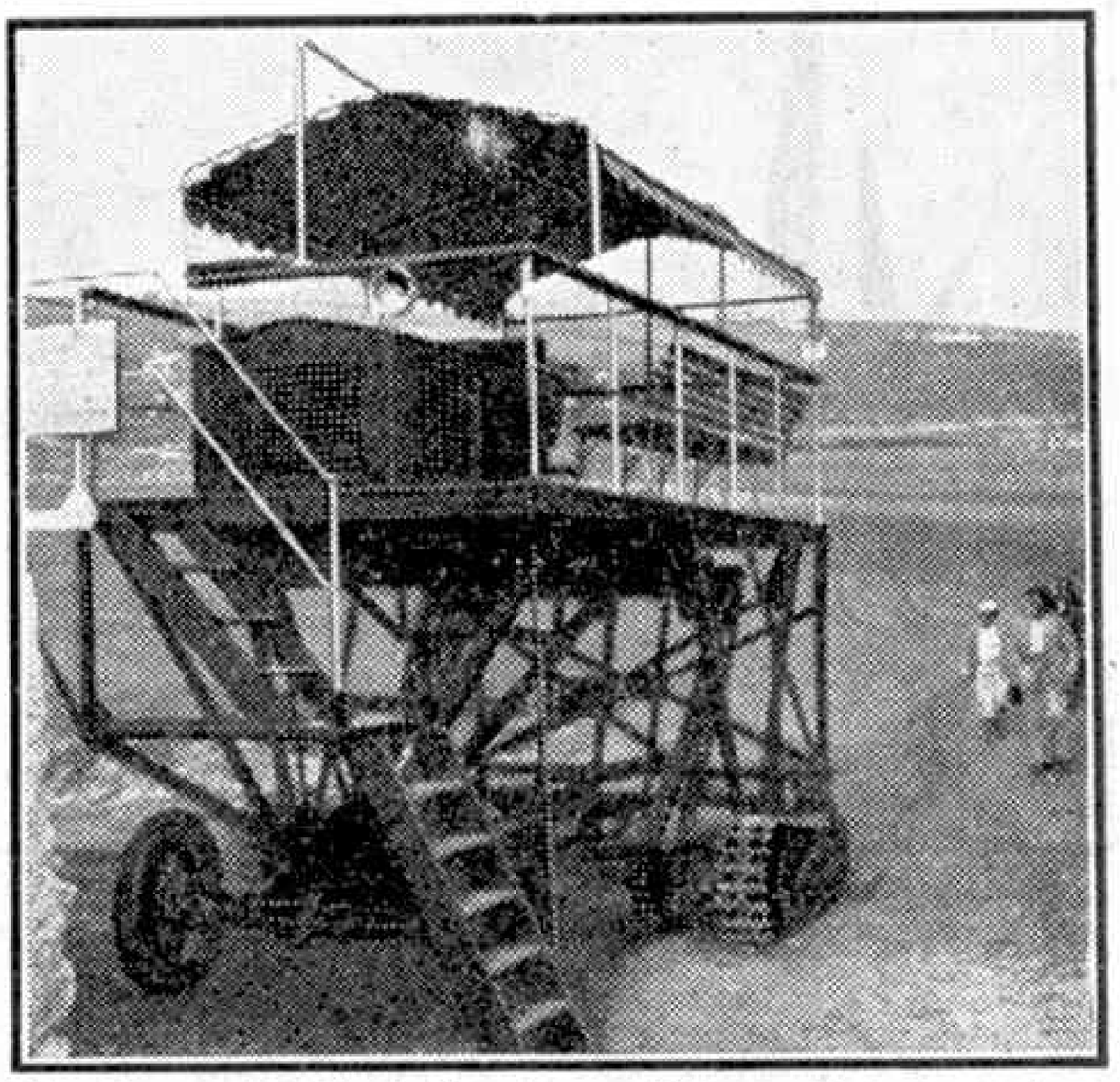
By H. D. Drake

WHILE on holiday in South Devon, just before the war, I came across the quaint but ingenious tractor type of conveyance shown in the accompanying photographs. This tractor was in operation between Bigbury-on-Sea and Borough Island, a distance of roughly a quarter of a mile, and it seems to have been designed solely for the type of work it is seen carrying out in the two illustrations.

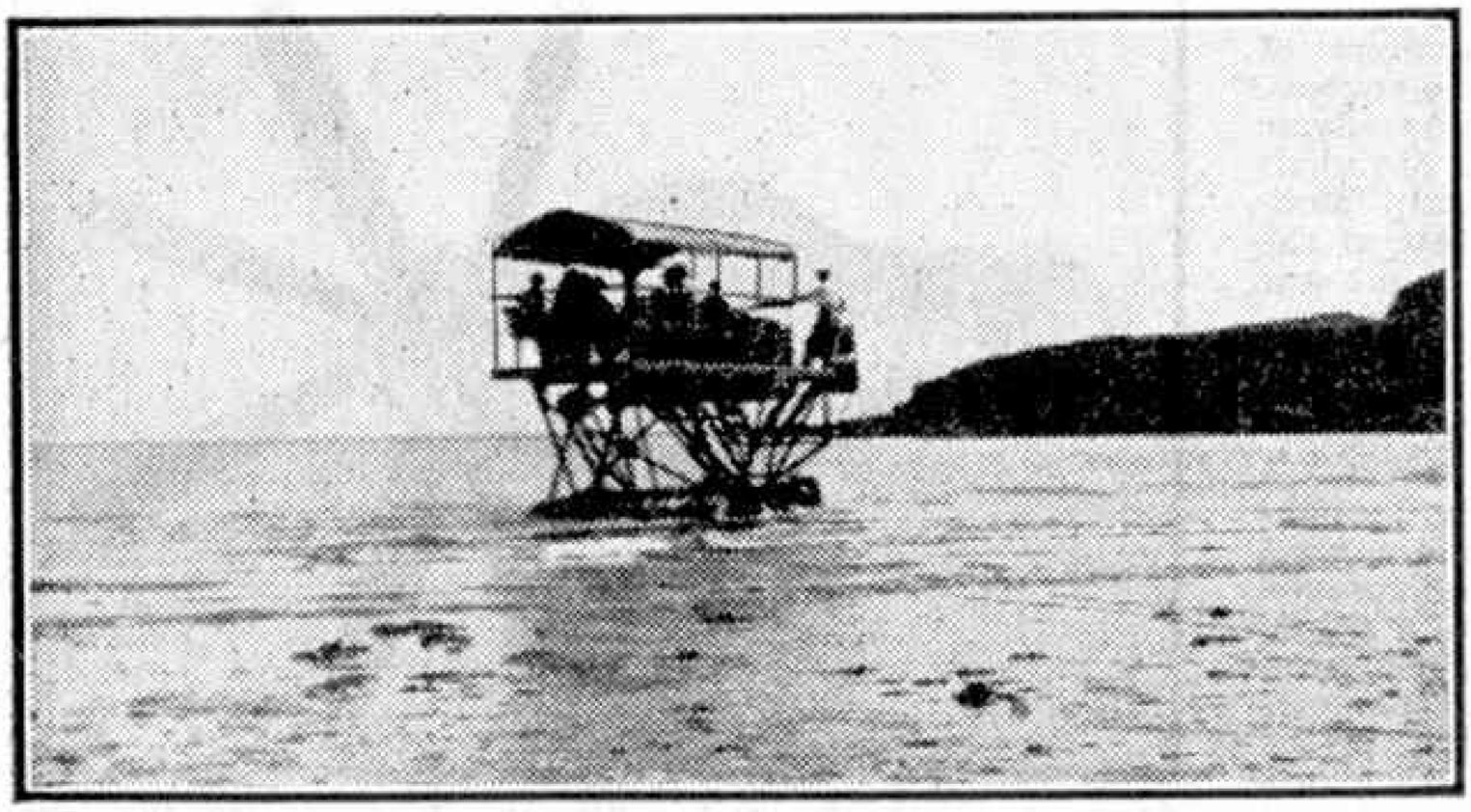
As far as I was able to ascertain, this tractor was powered by a normal car engine, the drive being taken from this to a motor car rear axle mounted under the platform. Sprockets fitted to the end shafts transmitted the power by means of chains to the creeper tracks on each side of the structure. The motor car had come in useful again by providing a front axle for the vehicle, and this was fitted with normal wire spoked wheels and pneumatic tyres.

Bigbury-on-Sea, situated on the South coast of Devon about five miles south of Modbury, was a very popular seaside resort before the war, with its beautiful stretch of golden sandy beach, and motoring visitors found a large car park at their disposal. Across the narrow neck of Bigbury Bay there is a rocky island, Borough Island, which can be reached at low tide by walking across the firm sand. This indeed is so firm that ordinary vehicles can then be driven across it easily and in perfect safety.

Borough Island, with its rocks, attracted a large number of visitors, especially those in search of adventure in the form of a little mild rock climbing. The walk back to the mainland in many cases ended in a run, however, for the tide comes in very swiftly just here, and I should imagine that many boots and shoes have been dried on those golden sands after the wearers have been overtaken by the incoming sea.



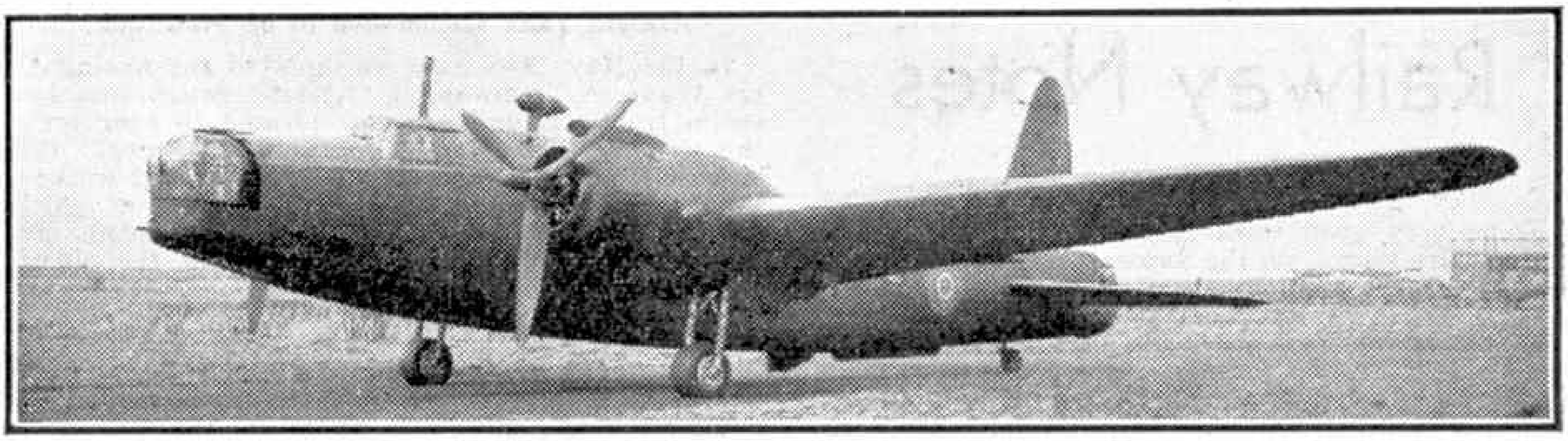
The Borough Island Tractor, which carries passengers between the island and the mainland of South Devon.



The tractor on its way out to Borough Island over sands still covered by the tide.

There is an hotel on the island, and the management of this catered for its visitors by conveying them to and from the mainland by means of this tractor. So the residents of the hotel are never marooned, whatever the state of the tide, except in very bad weather.

When first seen the Borough Island tractor raises a smile, but I think it is a very ingenious solution to the problem of providing means of access to the island.



A "Wellington" fitted with the squat "Compacta" tyre. Photograph by courtesy of Dunlop Ltd.

A Squat Aircraft Tyre

By T. R. Robinson

THE problem of reducing the size and weight of every part of an aircraft to the smallest possible limits without any sacrifice of efficiency is one that is always present in aeronautical design. Every ounce of weight or inch of space saved represents a definite improvement, and research along these lines is always in progress.

The undercarriage equipment is one of the particular points where effort of this kind is made, for although essential in taking-off or landing, this part of an aeroplane is quite frankly a nuisance during flight, occupying space that designers would far rather devote to other uses. At the same time, the undercarriage and its wheels, brakes and tyres must always be strong, reliable components, well able to deal with the severe shock loads and generally exacting conditions they will meet in service.

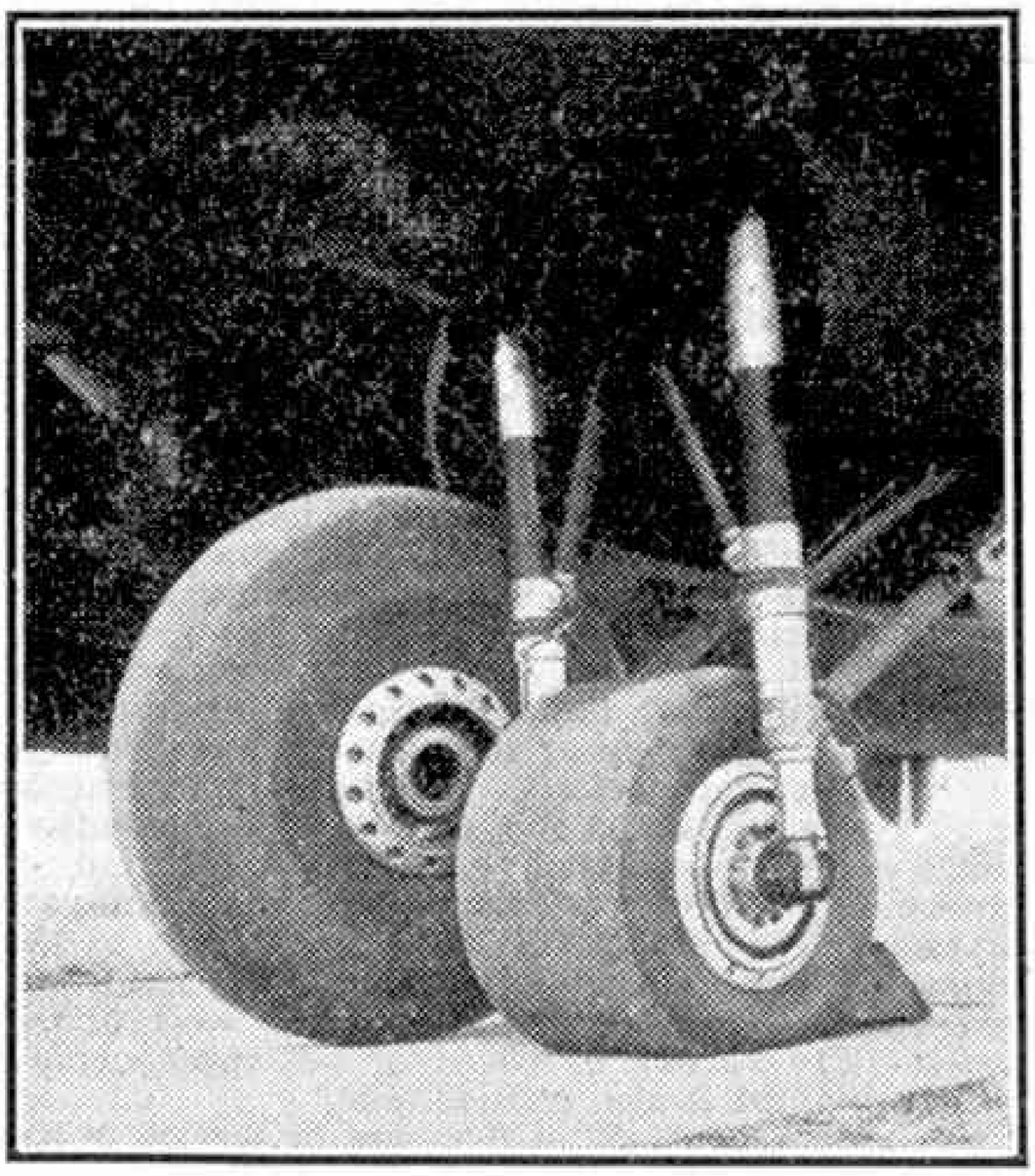
The tyres present special problems, for the conditions in which they operate differ considerably from those of car or motor cycle tyres. For instance, when an aeroplane touches down, the tyres may receive a heavy blow as they make contact with the ground, and they are also compelled to rotate at high speed as the machine moves across the aerodrome. Sudden contact, rapid acceleration, and the action of the undercarriage brakes normally subject the tyres to severe stresses, but in addition they must have a large margin of safety to meet emergencies.

Modern aeroplane design adds to the difficulties of tyre manufacturers by reducing the space available for housing the tyres when the undercarriage is retracted. In many recent types of aircraft the wing section is very thin, and the high wing-loading makes it necessary to place the spars close together. In such cases, a tyre of the usual dimensions may prove too large to fit between the wing spars. A further point is that present-day engines have a small frontal area, and their nacelle section is of shallow depth. Thus the diameter of a standard type of tyre, even if designed to be inflated to a high pressure, may still be too large to permit it to be retracted into the wing, unless the nacelle is specially bulged out to enclose it, a thing designers try to avoid if possible on account of streamlining considerations.

The production of a smaller tyre is by no means a simple matter, but as a result of a great deal of experimental work the Aircraft Division of the Dunlop Rubber Company have introduced a new type, known as the "Compacta," which is claimed to be of much smaller diameter than any other normal tyre of corresponding size and capacity. The reduction in size obtained by the use of the new design is apparent in the lower illustration on this page, which shows a "Compacta" beside a typical standard tyre.

The unusual shape of the tread of the new tyre is also to be seen, and this broad, flat form is a most important feature of its construction. The shape is obtained by making the tyre in such a way that the tread is kept to a flattened form when inflated, instead of being allowed to take up the curved shape usually characteristic of a tyre tread. As a result of this, a "Compacta" tyre of considerably reduced diameter possesses a tread of as great a width as a normal tyre. In fact its diameter is less than twice its width, whereas the diameter of a standard tyre is 3¼ or more times its width.

Savings of weight and space are the most valuable advantages of the new tyre, but there are others as well. An important one is that the loading level of an aeroplane fitted with it is lowered, as the fuselage is much nearer the ground than when an ordinary wheel and tyre is used. This is well shown in the illustration of a "Wellington" fitted with "Compacta" tyres at the top of the page. With the new tyre indeed the chief difficulty in this respect will be to provide clearance for the airscrews. The tyre will be found particularly valuable for aircraft powered by jet engines or fitted with contra-rotating airscrews, which are smaller than the normal type.



The new squat tyre alongside a normal one, showing the great difference in height.

Railway Notes

Good Work on the "Great Central"

Some very good work is being performed, when opportunity serves, on the former Great Central main line of the L.N.E.R. by the Gresley "Green Arrow" 2–6–2s. Schedules are easier and stops more frequent than before the war, but loads are still considerably heavier. On a recent journey on the 6.15 p.m. express from Marylebone to Sheffield, No. 4799 with an 11-coach train of 377 tons tare and fully 400 tons full met with severe delays between London and High Wycombe. From the latter point, passed dead slow, to Leicester, however, gains of 5 min. actual and 8 min. net were realised by enterprising running.

With the driver evidently anticipating further signal checks, the 17.5 miles from High Wycombe to passing Ashendon Junction were run easily in 23½ min., but once on G.C. metals proper some excellent work was done, the 26.4 miles between Ashendon and Culworth Junctions being run in 26 min. 17 sec., equivalent to the pre-war schedule of the 10 a.m. Down express. Downhill speeds did not exceed 69 m.p.h. and the lowest rate on the climbs at 1 in 176 past Finmere and Brackley was 54 m.p.h. Thus Woodford, 45.7 miles from Wycombe, was passed in under 51½ min., and despite a p.w. slack near Braunston the 59.8 miles from Wycombe to Rugby stop were completed in 68¾ min., schedule being 71 min. After a rousing restart from Rugby, the driver shut off as soon as a speed of 70 m.p.h. was attained on the long descent of Ashby bank, but even so Leicester, 19.9 m. from Rugby, was reached in 22 min. 22 sec. start-to-stop, the booked allowance being 25 min. (D. S. Barrie).

Scarborough Railway Centenary

One hundred years ago, amid much festivity, a railway was brought into use from York to Scarborough after rapid construction under the supervision of George Stephenson, to the order of the York and North Midland Railway. The Chairman of this company, George Hudson, was known at the time as "The Railway King" on account of his widespread promotion of plans for new lines. The Scarborough route eventually became part of the North Eastern Railway, and was linked with the newer coast lines from Hull and Bridlington in the south and Whitby and Saltburn to the north.

Immediately after leaving the great junction station of York and its maze of tracks at the north end, the first Scarborough line now crosses the River Ouse by an elevated bridge from which there is a fine view of the city, its ancient walls and Minster. The line winds amid pleasant woodlands alongside the River Derwent in the neighbourhood of Castle Howard. The heavy traffic carried in summer can move quickly, as in the whole 42 miles the only stations at which passenger trains regularly call are Malton and Seamer junctions. The other intermediate country places are served by buses as well as parcels and freight trains. Former North Eastern Railway locomotive types are still familiar on the route, though L.N.E. "Green Arrow" 2–6–2s, "Hunt" 4–4–0s and "J39" 0–6–0s have often been seen, in addition to ex-Great Northern and Great Central engines.

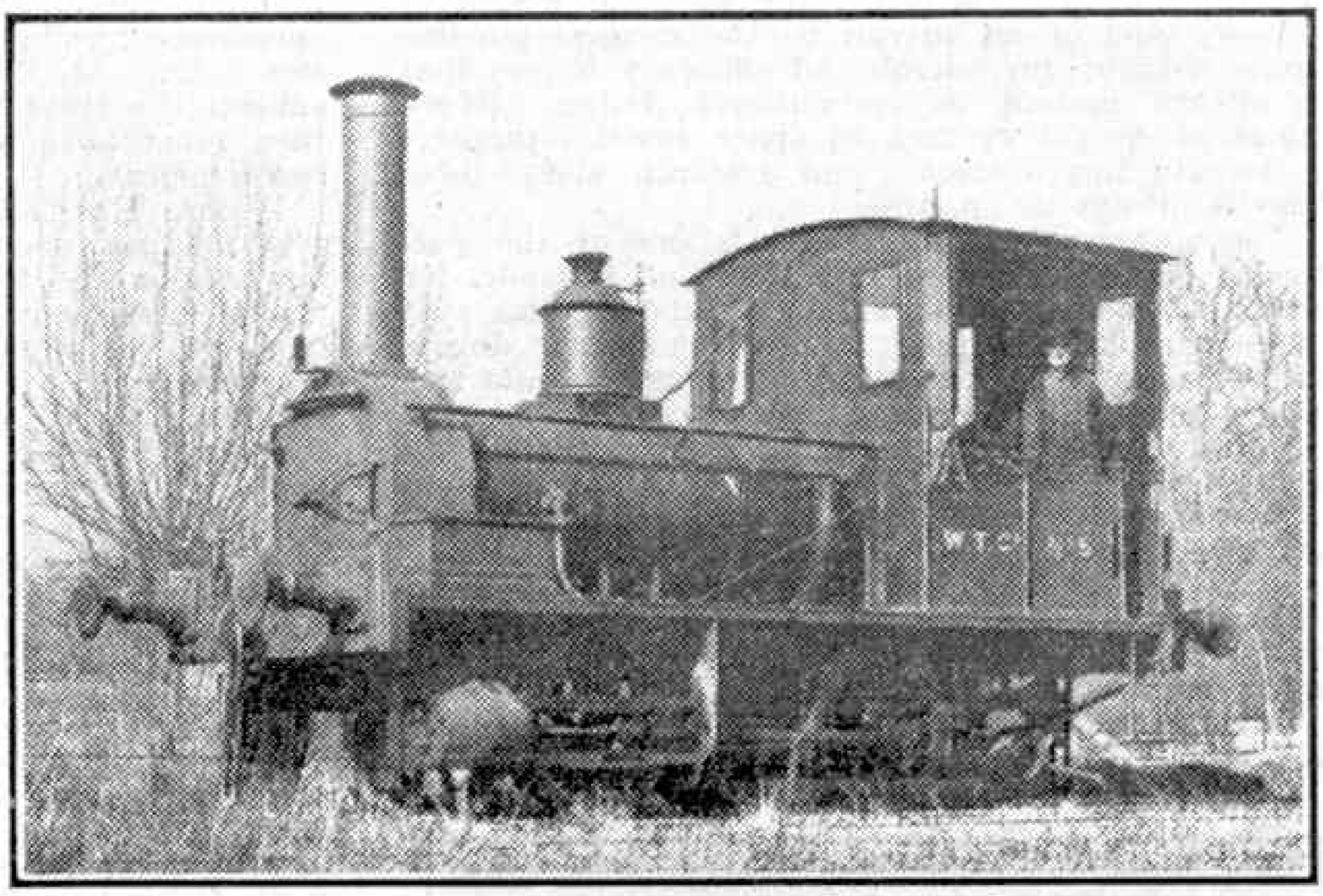
Ancient Tank Locomotive to be Preserved

In the May 1946 issue we reported the closing of the Wantage Tramway, a standard gauge roadside steam tramway, and are now pleased to hear from the G.W.R. that "*Jane*," formerly "*Shannon*," the 89-year-old 0–4–0 tank locomotive that had worked at Wantage since 1878, is to be preserved under Swindon auspices at a location to be decided. At the time of her withdrawal "*Jane*" was the oldest British locomotive in public service.

Southern Running Notes

No less than 26 or 27 different classes of locomotives usually pass through Tonbridge in the course of an ordinary weekday. These range in the passenger tender engine-group from "West Countries" to veteran Stirling rebuilt 4–4–0s, and in the goods tender class from "A–Y" 2–8–0s and modern "Q" 0–6–0s to ancient "01" 0–6–0s. Passenger tank engines include the former L.B. and S.C. "I3" and "I1x" 4–4–2 and "D3" 0–4–4 types, also S.E. and C. 0–6–4s and two 0–4–4 classes. Then there are Brighton "E1" and "E4" shunting tanks.

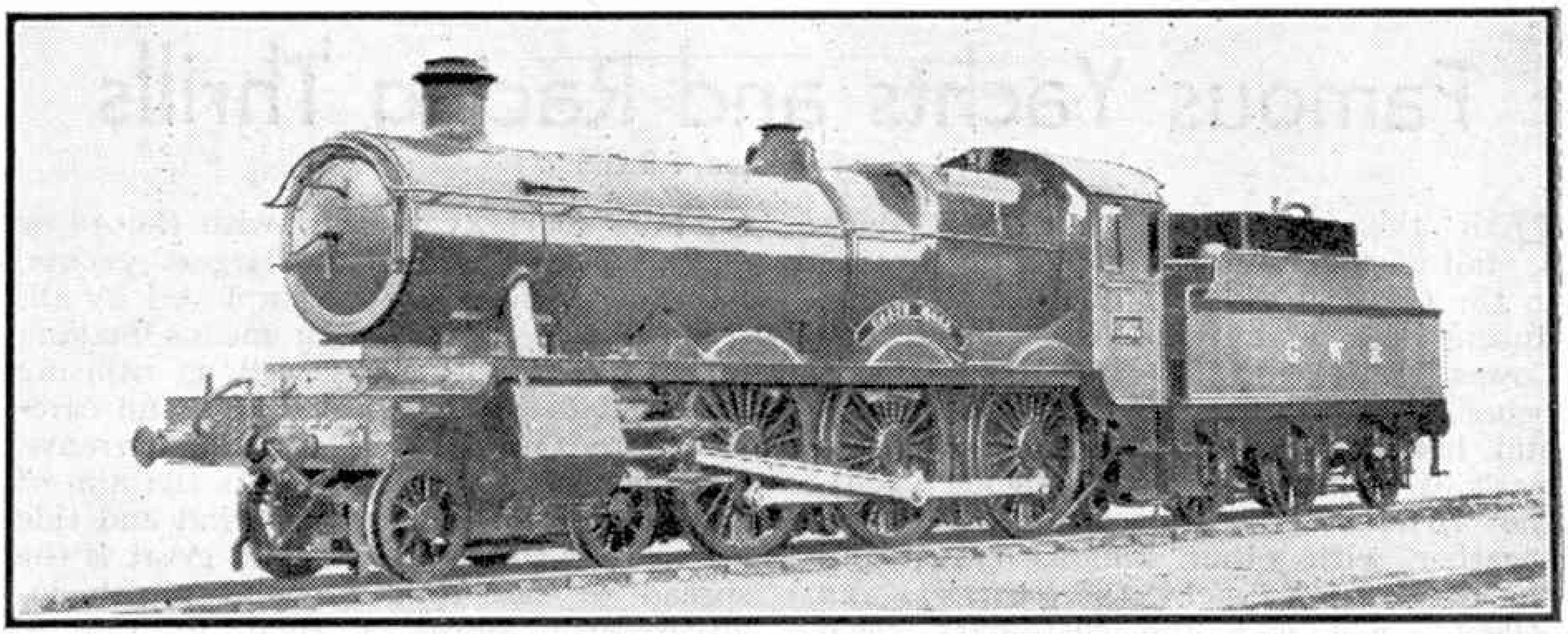
Tonbridge is a busy all-steam junction station not quite 30 miles from London on the Eastern Division main line to Dover. The Hastings direct line branches off by the engine shed at the east end up a steep gradient towards Tunbridge Wells. At the west end there are extensive sidings between the main London tracks through Sevenoaks, and the Redhill-Reading route, part of which was opened more than 100 years ago. The long approach curve on the main line at the foot of Hildenborough bank necessitates a service slack.



"Jane," the Wantage Tramway locomotive, built in 1857, which has been withdrawn from service. It is to be preserved by the G.W.R. Photograph by Percy Clark, Wantage.

At Ashford, a similarly interesting junction station 26½ miles farther east, full speed running is permissible on the fast lines which, as at Tonbridge, pass through the centre clear of platforms. There, the lines branching off at the east end, where the Works and extensive sidings are also situated, are those southward to Hastings via Rye; to Canterbury and Ramsgate northward. The locomotive shed is adjacent to the Canterbury line. The route to London via Maidstone East diverges a short distance to the west of the station. The variety of goods or passenger engines seen at Ashford is also considerable.

New "West Country" 4–6–2s are in service at the time of writing up to 21C 133. The striking appearance of their long, light green outer casing with bright yellow stripes is now familiar in Kent, also



G.W.R. 4-6-0 No. 5955 "Garth Hall," the first oil-burning passenger locomotive on that line. It is for service on the London and Bristol route. Other G.W.R. oil-burners are of the 2-8-0 mineral class referred to in these pages in November 1945. Photograph by courtesy of the G.W.R.

in Surrey and Sussex, as they have worked Royal and other special passenger, regular parcels and goods trains on the Central Section recently, in addition to short running-in trips from Brighton.

Engine No. 21C 110 was named "*Sidmouth*" at a ceremony held at Sidmouth Junction on 27th June. Other names recently bestowed on engines of the "West Country" class are: "*Axminster*," "*Seaton*," "*Exmouth*," and "*Budleigh Salterton*."

A half-hourly service of fast electric trains with refreshment-cars is running again this summer on Saturdays between Waterloo and Portsmouth, a 74-mile run, in connection with Isle of Wight services, as well as to cater for Southsea and other places.

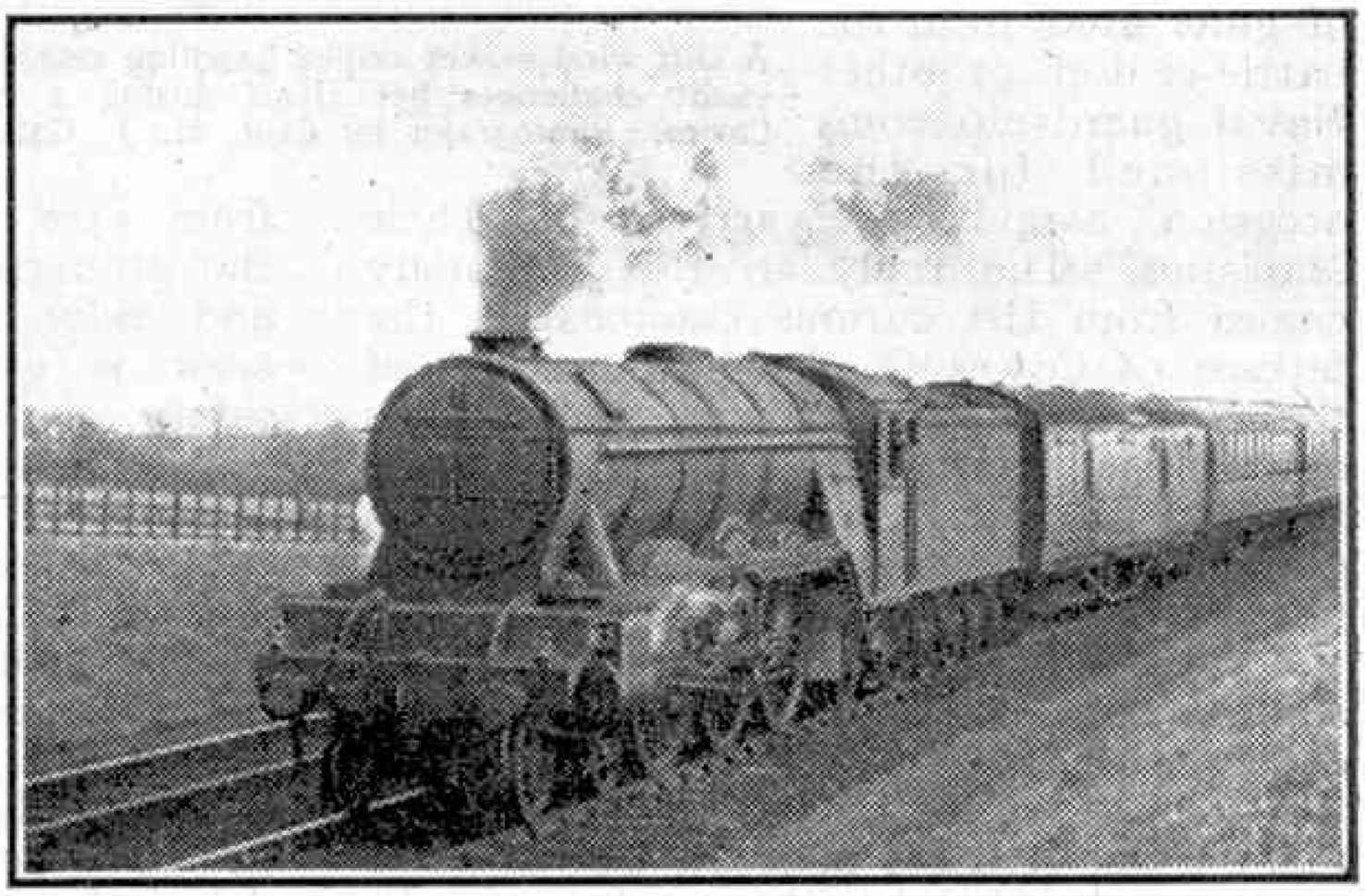
Some Fast Running by "Gainsborough"

We illustrate on this page the "A3" No. 2597 "*Gainsborough*," one of the intermediate series of "Super-Pacifics" built at Doncaster in 1930 and a very fine performer. Mr. R. A. H. Weight writes that some time before the recent war, when fast schedules were operating, No. 2597 in charge of Driver Ferguson, Gateshead, was working through with a 16-car East Coast express from London to Newcastle with the same crew. At York it arrived 1 min. early. With a crowded complement of passengers, the load was 570 tons behind the tender, but "*Gainsborough*" soon had that heavy train moving at a mile a minute on the level. Tollerton, 10 miles, was passed in 13 min. 25 sec.; then, mainly on slightly adverse grades, the next 27 miles to Cowton were covered in 25 min. with a maximum of 68 m.p.h. After a slow run in along the platform, Darlington was reached 1½ min. early in 46½ min. from York, 44 miles away, an excellent performance indeed near the end of a long and arduous run.

On another occasion, with a lighter 460-ton load on the 5.45 p.m. King's Cross-Newcastle express logged from the start, No. 2597, in charge of the regular driver of the period, J. Eltringham of Gateshead, covered the 27 miles between Hitchin and Huntingdon in 20½ min., averaging 83.8 m.p.h. for 12¼ miles partly downhill at 1 in 200-264, and touching 90 near Three Counties. The first 70 miles through from London were covered in 68 min., but signal and permanent way slowings now followed. Peterborough, 76½ miles, was passed slowly in 79½ min., ahead of time, and acceleration on the level was subsequently rapid, 65 being attained by Tallington, leading to a good climb of Stoke bank with a minimum of 52 on the final 1 in 178 and giving an arrival at Grantham two min. before time, in 112 min. Allowing for delays, the net time for the 105½ miles was no more than 108 min. With the same train at a later date, weighing 500 tons on account of an extra coach and more passengers, the average running was almost as fast. Many fine runs have been recorded behind all three classes of Gresley "Pacifics"; during the last six years loads have often been much heavier but timings and speeds slower.

G.W.R. Oil-Burning Experiments

The G.W.R. have just completed the conversion of the first of their passenger locomotives to be altered from coal to oil burning. The locomotive is No. 5955, "*Garth Hall*," which has been undergoing trials at Swindon Works before being put into use on fast passenger trains between London and Bristol. Last autumn, as stated in the "*M.M.*" in November 1945, the G.W.R. announced their intention to convert experimentally 18 heavy freight 2-8-0 locomotives from coal to oil burning owing to the acute shortage of coal. Of these, 11 are now giving satisfactory service in South Wales, hauling coal and freight trains for runs up to 250 miles between refuelling points.



L.N.E.R. "Pacific" No. 2597 "Gainsborough" of the "A3" class on a York express. Photograph by H. Gregson, Sutton-in-Ashfield.

Famous Yachts and Racing Thrills

By Arthur Nettleton, F.R.G.S.

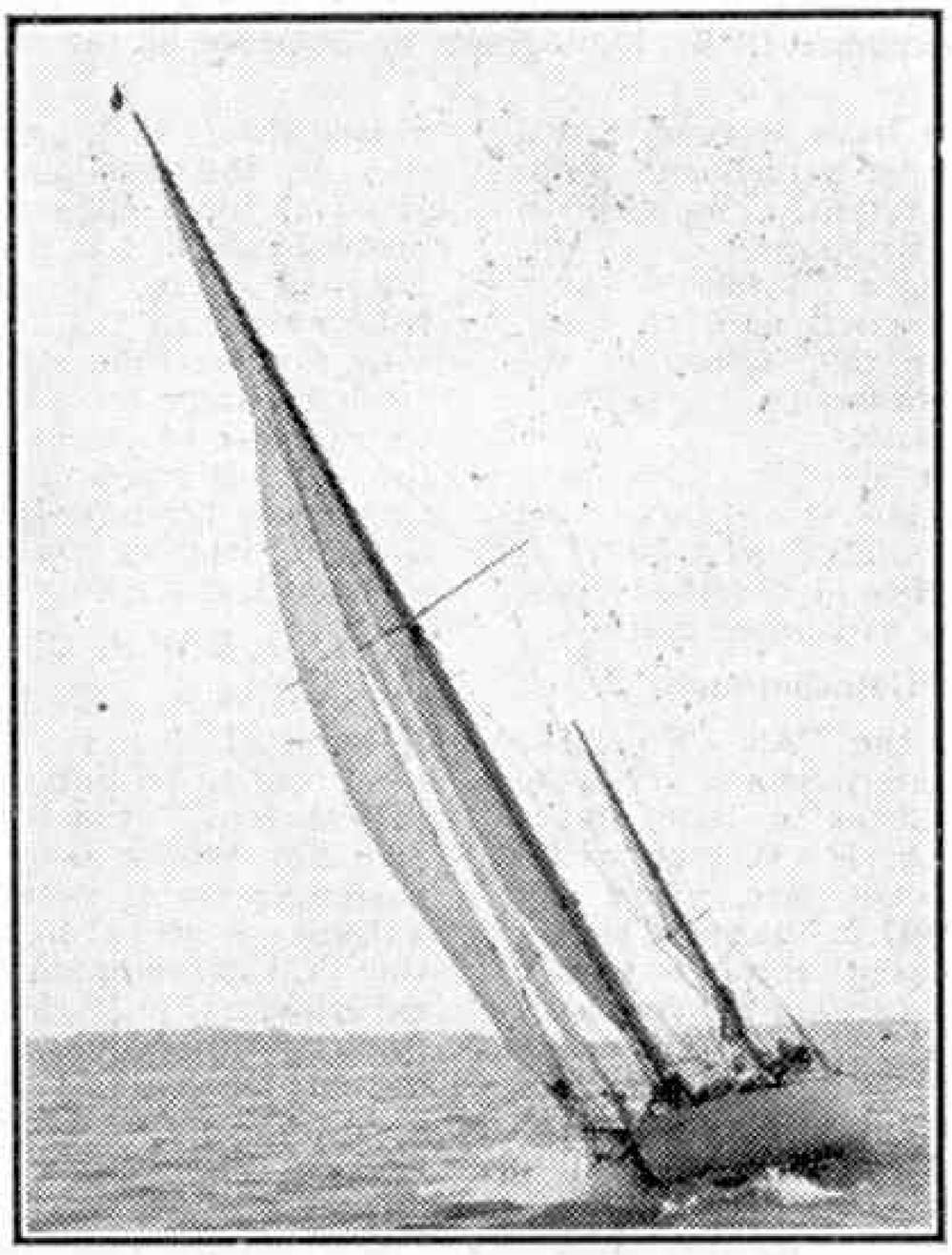
FOR the first time since 1939 sleek tall-masted yachts will be congregating in the Cowes Roads off the Isle of Wight during the first week in August, for Cowes Week with its famous regatta is being revived. To yachting enthusiasts and holidaymakers alike this will be a week of thrills. The King's racing yacht, the *"Britannia,"* is expected to take part, together with other famous craft, and the royal steam yacht, the *"Victoria and Albert,"* will give the customary regal touch to the proceedings.

Cowes Week is the foremost yachting festival, not only in Britain but in the whole world. The vessels taking part in the contests this year will have a total value of scores of thousands of pounds, and throughout the history of the regatta literally millions of pounds have been spent on the sport.

The Week has its official opening when the King and Queen arrive in the Roads aboard the *"Victoria and Albert."* As the royal steam yacht approaches, a salute of guns fired from the battle-cruiser or other Naval guardship commissioned for the occasion heralds the arrival of Their Majesties. The reply to this ceremony comes from the curious cannons on the terrace of Cowes Castle, headquarters of the Royal Yacht Squadron, while every craft in the vicinity dips its ensign. Finally, the flag on the *"Victoria and Albert"* is dipped in acknowledgment. Cowes Week has started!

To the landlubber some of the finer aspects of yacht racing are perhaps obscure. The biggest yachts, such as the *"Britannia"* and *"Shamrock,"* inevitably attract the greatest interest, but thrilling sport is provided by the smaller vessels. The six-metre boats race on only a ten-mile course, compared with the 40 or more miles raced by the largest yachts, but the same tactics are employed by all.

Successful yacht racing means making full use of position, as well as utilising the wind to the best advantage and carefully studying the tides and currents. Getting the windward berth is the aim of each competitor when both wind and tide are against the course, and so great is the spread of sail that a yacht which inadvertently allows a rival to sail to windward may be almost becalmed by this wrong tactic. Different methods are necessary when the wind blows from the other direction. A stern position then enables a challenger to capture the leader's wind and the suction caused by the front vessel's movement can be employed in overhauling.

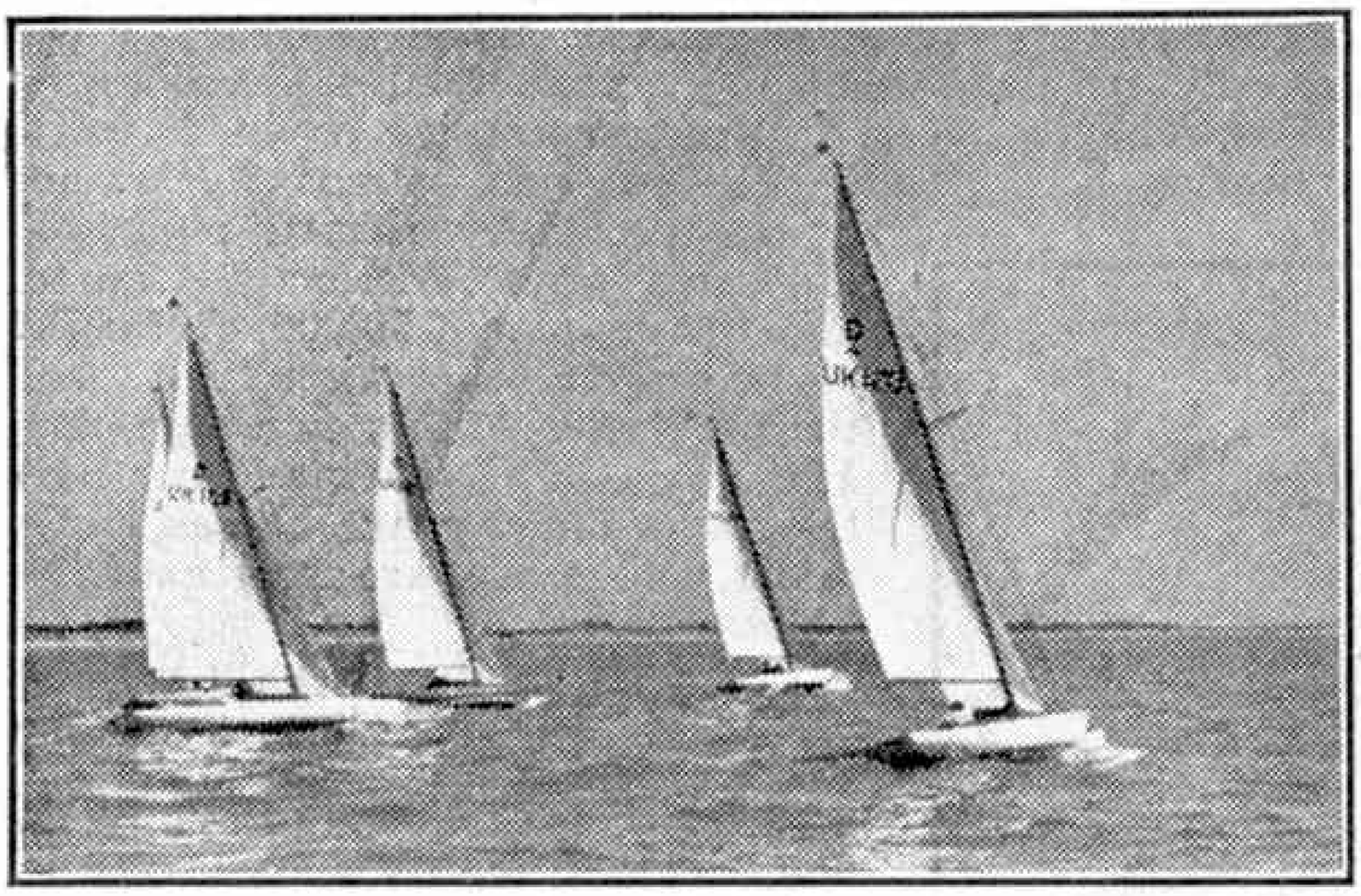


A stiff wind makes skilled handling essential as a yacht challenges her rivals during a race off Cowes. Photograph by Capt. H. J. Galsworthy.

It is also imperative that the crews shall know the peculiarities of their craft—and every yacht has them—in addition to being skilled in handling the vessels. The tightness or slackness of the sails necessary to attain the utmost speed varies with individual yachts, and these matters differ further from race to race, being influenced by the strength and direction of the wind and tide. Clockwork precision by the crew is essential for both speed and safety, since a small mistake may easily result in the 170-ft. mast being carried away.

Cowes Week has its code of regulations and customs in other directions too. Some of the strangest concern the flags flown by the yachts. During this one week in the year, the King's flag is an ensign bearing only the Prince of Wales' feathers as its decoration. It is his symbol as Admiral, not of the Royal Navy, but of the Royal Yacht Squadron. The flag,

which has a red and blue ground, is hoisted on the mast of the *"Britannia."* The Royal Standard is flown from the mainmast of the *"Victoria and Albert,"* however, and from the foremast of this ship flies the golden anchor ensign of the Lord High Admiral.



A race in progress during Cowes Week. Photograph by Captain H. J. Galsworthy.

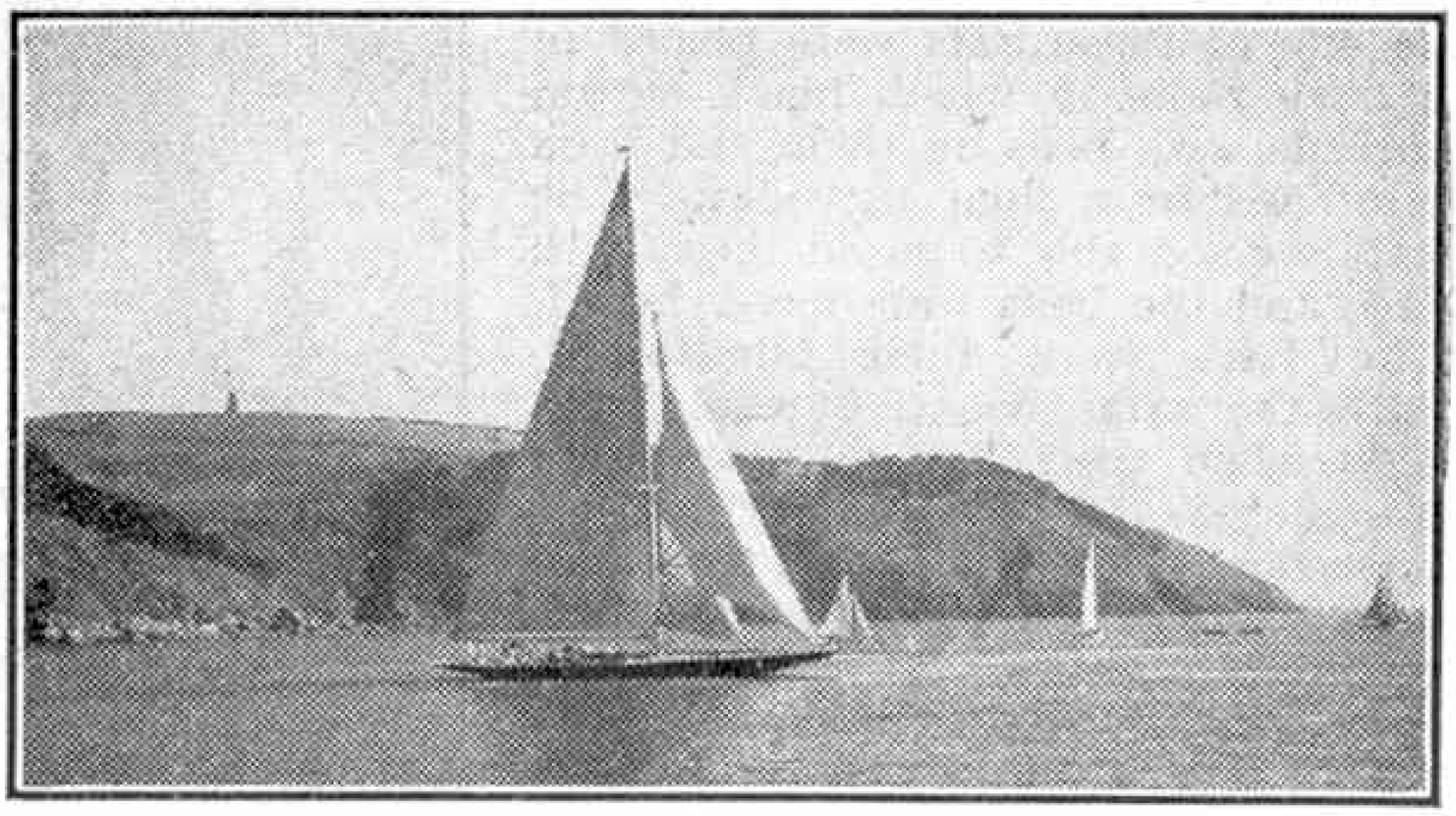
Great interest naturally centres round the *"Britannia,"* both by reason of her royal ownership and because she has won so many awards. Although by no means a costly craft, as racing yachts go, she has long been perhaps the best boat of her type afloat. She was built for £9,000 in 1893, but could not now be replaced for less than £50,000, and it is unlikely that an identical yacht with the same qualities could be built. Her builders seem to have imparted to her some mysterious attribute that cannot be defined or repeated. Her trim hull, with 10,000 sq. ft. of canvas billowing above, is a familiar sight at other regattas. But it is at Cowes that she has achieved her most spectacular successes.

The Royal Yacht Squadron itself has an absorbing story. It was founded in 1812, and since 1815 its members have had the unique privilege of flying the White Ensign, the flag of the Royal Navy, over any of their vessels of more than 30 tons burden. That privilege carries with it the right to use Government moorings and to enter ports without paying the usual dues, and several other benefits never otherwise granted to British ships outside the Royal Navy.

But the Royal Yacht Squadron is the most exclusive club in the world, and extremely strict scrutiny is made of applications for membership. Cowes Castle, the headquarters of the Squadron, was at one time Crown property, and was built in the days of Henry VIII to defend the Solent. The Squadron acquired it in 1856.

For more than 100 years, with the exception of the periods covered by the last two wars, there has always been a race during Cowes Week for a trophy presented by the reigning Sovereign. The list of winners includes the names of nearly every outstanding vessel in British yachting history, including the present royal racing craft, *"Britannia,"* for she won the coveted cup during Queen Victoria's reign, when she was owned by King Edward VII, then Prince of Wales.

The most important race ever held in the Cowes Roads, however, was that of 1851 for the so-called "America's Cup," the trophy offered as an international award by the Royal Yacht Squadron. As is well known, this 100-guinea silver cup was carried off by the United States entrant, the *"America."* Less widely known is the fact that she actually ran a short course, omitting to round the Nab Lightship, but that the Royal Yacht Squadron committee (*Continued on page 348*)

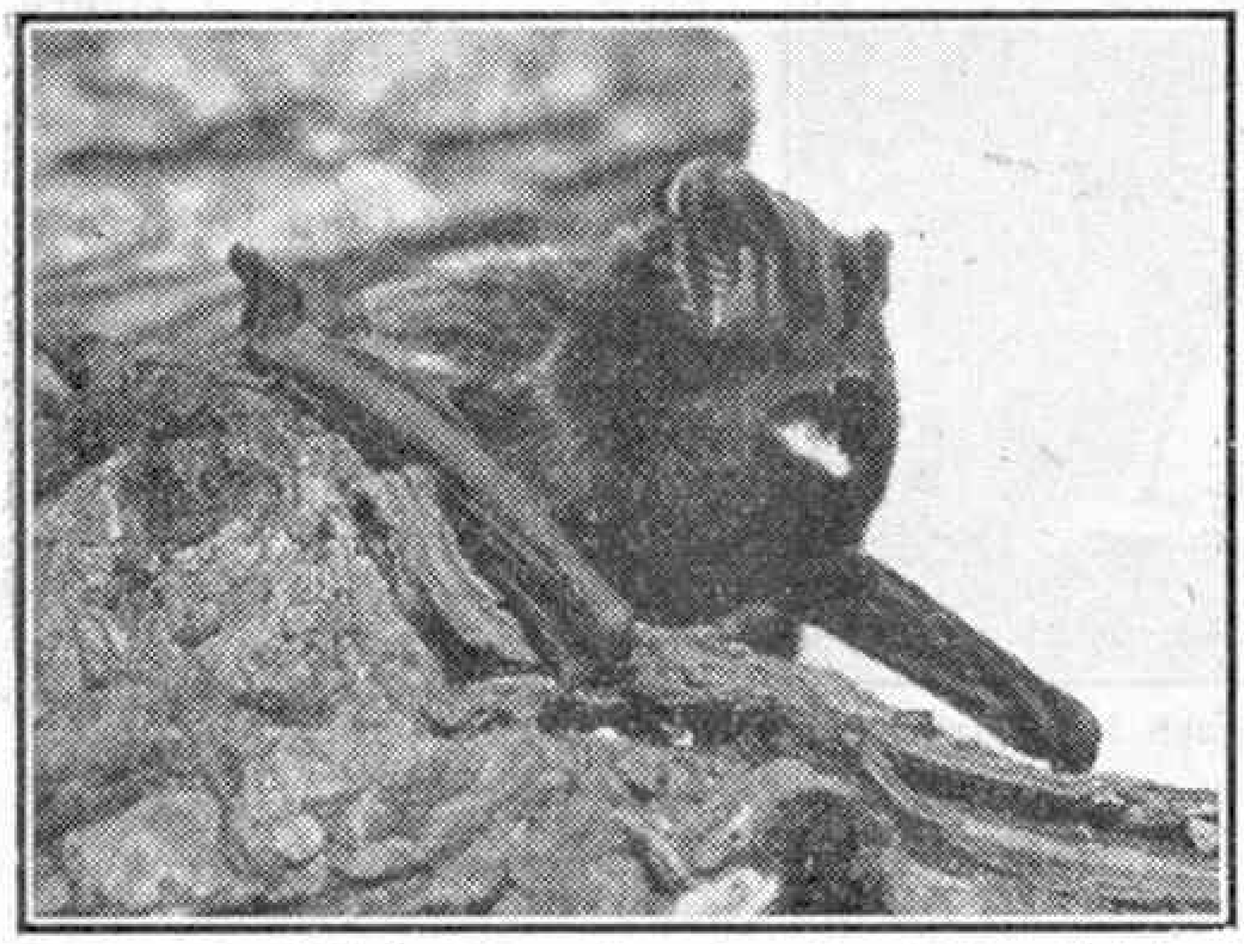


"Endeavour II" racing off Dartmouth. She is built of steel and has a steel mast 168 ft. in height. Photograph by A. Lamsley.

The Flight of the Bat

By R. H. Ferry

IN spite of the proverbial phrase "As blind as a bat," bats can see, but they have very small eyes and can only see about an inch in front of their noses. They suffer too the handicap of poor hearing.



The mouth of the bat transmits notes of so high a pitch that they cannot be heard by human beings.

For many years the wonderful aerobatics of bats, as they power-dive in the deceptive and poor light of the evening, have puzzled naturalists and scientists. With such extreme short-sightedness, how do they avoid disastrous crashes? It is now known that these creatures, the only flying mammals, are equipped with a sensitive fleshy organ, carried either in the ear or on the nose, which in operation is not unlike radar.

Very many interesting experiments have been carried out to show this. In one of these bats were placed in a dark room in which black cotton threads with bells on them had been stretched from floor to ceiling. The bats seemed able to avoid these with ease and the bells were never heard. The bats were then blindfolded, with the same negative result, and only when their ears or noses were obstructed did their flight become uncertain. The webbed wings of bats are also believed to have super-sensitive qualities.

In radar high-frequency radio waves are transmitted, and their echoes as they strike obstructions and are reflected are tuned in and recorded. With the help of radar an aeroplane can be flown "blind" in the certainty that all ahead is clear, or can take evasive action if tell-tale echoes are received from mountains or thick storm clouds. The bat uses sound waves made by its peculiarly shaped mouth in the same way. These notes are of high pitch, about 50,000 cycles per second; their echoes are "felt" and the bat dodges or flies on accordingly. The notes of course are far above the sound range of the human ear in pitch, though dogs are sometimes able to hear them.

It appears that bats only use this radar-like power when in flight. When they zigzag in so-called "crazy" flight they are following directly the flight of the moths and insects on which they feed. So sensitive is their own organ that the vibrations set up by a moths' wings are distinctly felt, and only when the bat is right up against its victim does it use its sight. When not hunting, bats fly fast and straight and each kind has its distinctive wing action, which can be spotted by experienced observers.

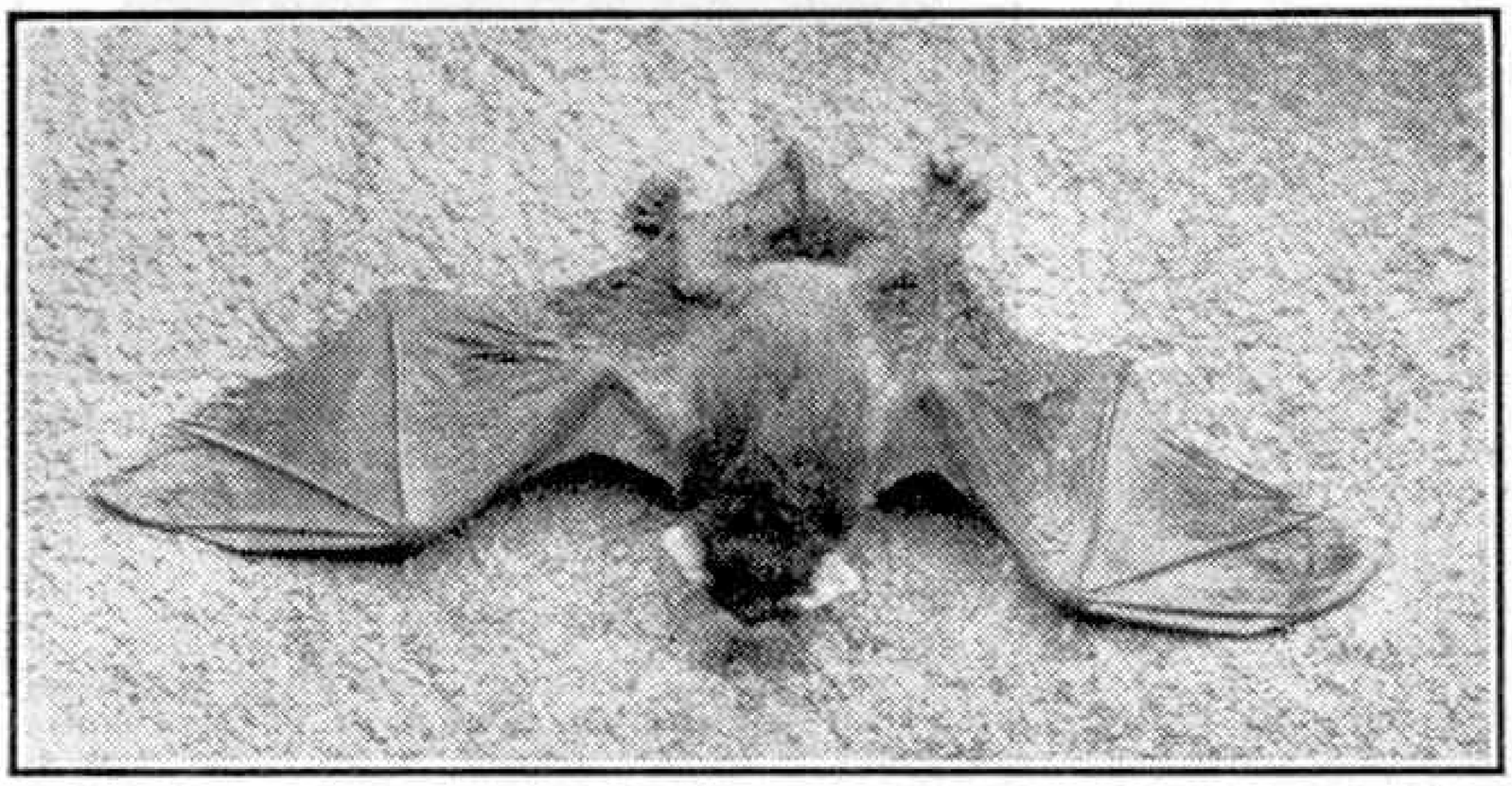
Bird flight has been very closely watched by aeroplane designers and fliers, and it is surprising that bats have not come under closer observation from this angle, for they can outfly birds (*Continued on page 348*)

The bat's ears are supposed to be so sensitive to the high pitch sound it utters that it can detect obstacles by means of echoes from them. Photographs by Eric Hosking.

Of General Interest

Camouflage Co-operation

The Kalima butterfly of India is a gorgeous spectacle in flight, for its wings are brilliantly coloured blue and green, and are tipped and edged with orange. It is in fact a very conspicuous object when it is on the wing, but it has the strange faculty of seeming to disappear altogether in a flash. The explanation of the puzzle is very simple. When the butterfly alights it almost instantly folds up its wings to give these the shape of a leaf, as the undersides of the wings are of the same colour as a dead leaf, and have markings that resemble the ribs and veins of a real leaf. The insect immediately blends so well into its surroundings that sight of it is lost.



A pipistrelle bat, showing the undersides of the wings with their efficient bracing.

This butterfly is by no means the only one that can disappear in this way. There are others that turn themselves into imitations of leaves on alighting, with the object of escaping notice, and do this not in ones but in groups, scores of the insects working all together to produce the most natural-looking representation of foliage on what otherwise would be a mere stalk. A single one of these insects doing this might give the game away, for an odd leaf on a stalk can be so unnatural in appearance that the only effect would be to attract notice. Posing in a group, as some butterflies do, has an entirely different result, and it is noteworthy that the insects move about and re-form until their camouflage is perfect. Then they remain absolutely motionless.

Where is the North Magnetic Pole?

The North Magnetic Pole appears to have wandered to a considerable distance from the place which it has long been thought to occupy. This is the Boothia Peninsula in Northern Canada. The first doubts were cast on the belief that this was its home by Sir Harold Spencer Jones, the British Astronomer Royal. In order to find the exact position it is necessary to make measurements of the strength and direction of the Earth's magnetic field at as many different points as possible. Naturally this has been done chiefly from the warmer regions of the Earth's surface, and very few observations have been made in the icy wastes north of Canada. Sir Harold based calculations of the position of the Pole on the measurements available, and was surprised to find that these seemed to show that its position was considerably north of Boothia. Now his results have been confirmed by the flight of "*Aries*," the R.A.F. "Lancaster" that made special Arctic flights in May of last year. These showed that the North Magnetic Pole has at last been hunted down, and that it is in the Sverdrup Islands, to the west of Northern Greenland. This position is actually 300 miles away from the place we have long thought it to occupy, but is within 75 miles of that calculated by the British Astronomer Royal.

Growing Coloured Cotton

It would clearly save a lot of worry and trouble if clothing materials could be grown ready dyed to any desired colour. At first thought this seems impossible, but actually new varieties of cotton have been grown in Central Asia that are naturally coloured in a range from brown to green. The green was the first to be produced, in 1940, and since then grey-brown and coffee-coloured cotton have been grown. It is interesting to find that brown cotton gives the highest yield of fibre and the toughest material. All the colours are fast, as the colouring matter is part of the cotton fibre itself.

These new cottons have been produced in an institute devoted to cotton plant study in Tashkent, in Turkestan, in the U.S.S.R. Many other interesting discoveries have already been made there, including varieties of cotton that ripen early and are resistant to disease.

Soapless Soaps

We seem to go to a great deal of trouble to keep ourselves and our belongings clean—in spite of the beliefs of the humorist, especially in regard to small boys—for the amount of soap that is manufactured in the world is enormous. In the United States alone nearly 2,000,000 tons of soap are made every year in normal times. The British production too before the war must have been enormous.

Soap is very effective in making an emulsion of grease and dirt, but unfortunately it forms insoluble compounds with the chemicals that are present in hard water. The result is difficulty in wringing out materials washed with it, and the cause of this is easy to see in the ring that forms in wash basins and baths, especially where hard water is employed.

There is a way of overcoming this difficulty, but it will probably be a long time before it is put into operation on a large scale. This is the use of detergents that are not soaps, but form only soluble compounds with the minerals present in water. These soapless soaps are more powerful than the traditional kind to which we are accustomed, but are harmless to the skin or materials on which they are used.

Swifts and Skinks

Do you know the difference between a swift and a skink, and in any case what are they? Actually they are both lizards that are regarded as bringers of good luck, and are kept as household pets or mascots. Scientists can distinguish them, but they are so much alike that it takes an expert to decide which is which. A common swift in the U.S.A. is the fence swift, a lizard that perches on stony fences, walls and doorsteps. They really are swift, as their name suggests, for it is almost impossible to capture one by hand; and even if it is caught in most cases it is only the tail that is seized, for like almost all lizards the swifts can break this off at will.

Air News

New British Helicopter

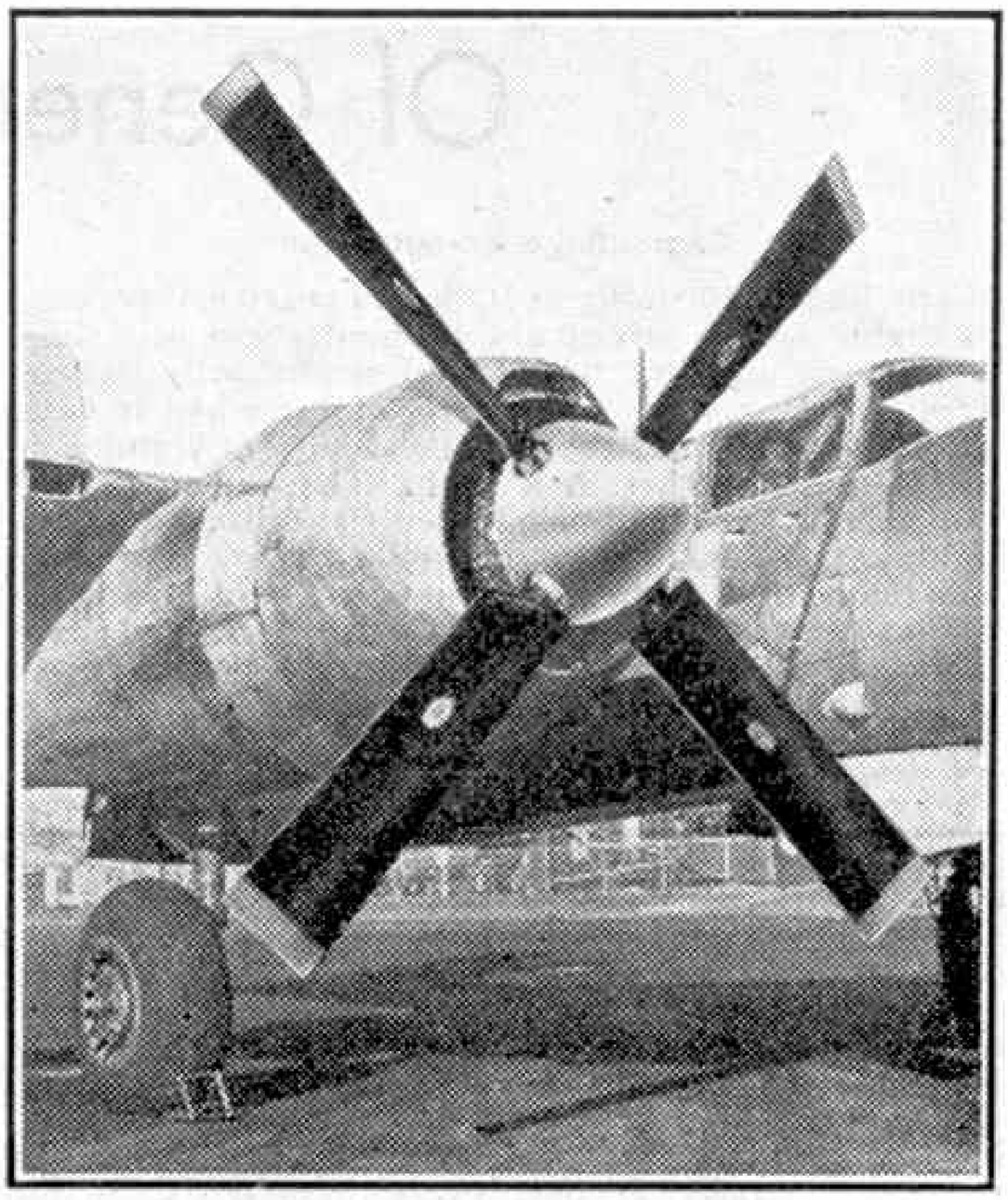
The new Cierva W.9 single-rotor helicopter was demonstrated in public for the first time at Southampton air pageant on 22nd June last. The outstanding feature of this machine is that rotor torque is controlled by means of a laterally-directed jet in the tail instead of by a tail rotor. Further details and a photograph of the Cierva W.9 will appear in an early issue.

A Square-Tipped Propeller

A radical new type of propeller blade, similar in appearance to the vanes used on windmills for hundreds of years, will soon make its appearance on some of the newest American transport aircraft. It is square-tipped instead of elliptical, and almost rectangular in shape, and has been developed by the Hamilton Standard Propeller Company to meet the tremendous advances made in aircraft speed and engine power during the war.

This square-tipped blade is the result of four years of aerodynamic research designed to maintain high propeller efficiencies as aeroplane speeds approach the speed of sound. Width added at the tip affords the maximum increase in blade power absorption with the minimum weight increase, thus permitting the design of lighter blades. The square tip, because it carries the aerofoil section for the blade's entire length, makes it unnecessary to distort the aerofoil section at the tip as was required with the round-tip blade; this helps to improve blade performance. Further, it permits the use of a thinner, less cambered aerofoil section at the tip, resulting in a substantial reduction of compressibility effects.

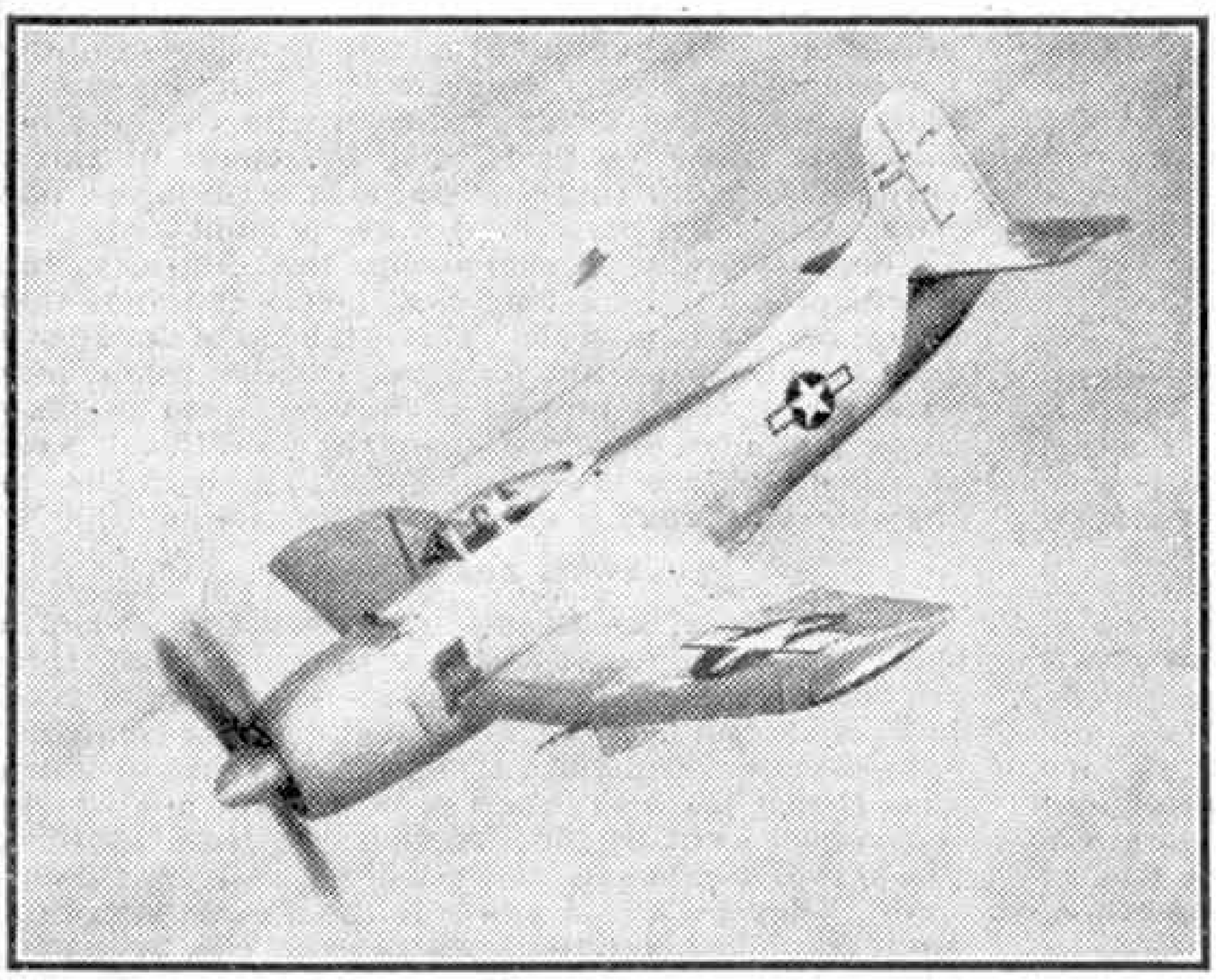
The earliest version of the square-tipped blade was first fitted last year to the North American "Mustang" and substantially improved the aircraft's high-speed performance without sacrifices in any other direction. It was of duralumin and the forerunner of Hamilton Standard's new series of square-tipped blades, although it was more rounded at the leading and trailing edges of the tip than the 1946 models, which will be used on such new commercial and military aircraft as the Martin 202 and Consolidated Vultee 240. J.W.R.T.



American aircraft propeller, with square-tipped instead of elliptical blades. It has been developed by Hamilton Standard Propellers, U.S.A., by whose courtesy this photograph is reproduced.

Martin "Mauler"

The new Martin "Mauler," shown in the lower illustration on this page, is what we in this country call a naval "Strike" aircraft, in the same class as the Blackburn "Firebrand." That means that it is a carrier-based aircraft, designed to carry a torpedo or bombs. The "Mauler" is powered by a single 3,000 h.p. Pratt and Whitney "Wasp Major" engine, and although hardly a handsome aeroplane it has a good performance and packs a hefty punch. It has a top speed in level flight of over 350 m.p.h., and can safely exceed 500 m.p.h. when attacking a target as a dive-bomber; but special intermeshing, finger-type dive-brakes are fitted to keep down the speed in a dive to about 350 m.p.h. This makes possible a lower-altitude pull-out and, consequently, greater bombing accuracy. As a dive-bomber, the "Mauler" carries externally 4,000 lb. of bombs or rockets, which are interchangeable with a single torpedo and extra rockets or bombs. This is additional to a fixed armament of four 20 mm. cannons. The aircraft has a wing span of 50 ft., is 41 ft. 8 in. long and, carrying a single 2,000 lb. bomb, weighs 19,500 lb. J.W.R.T.



The Martin "Mauler," in service with the U.S. Navy. Photograph by courtesy of The Glenn L. Martin Company, U.S.A.

Huddersfield Firm Plans Private Aerodrome

Industry demands rapid communications and transport more than ever before, and to this end a private aerodrome has been planned by Mr. David Brown, Managing Director of David Brown and Sons (Huddersfield) Ltd. and David Brown Tractors Ltd. The aerodrome, covering 50 acres of land reclaimed from Crosland Moor, will be on a plateau to the south of the town, a few hundred yards from the head office of the David Brown companies. At present the nearest aerodromes are at Manchester, Yeadon and Doncaster.

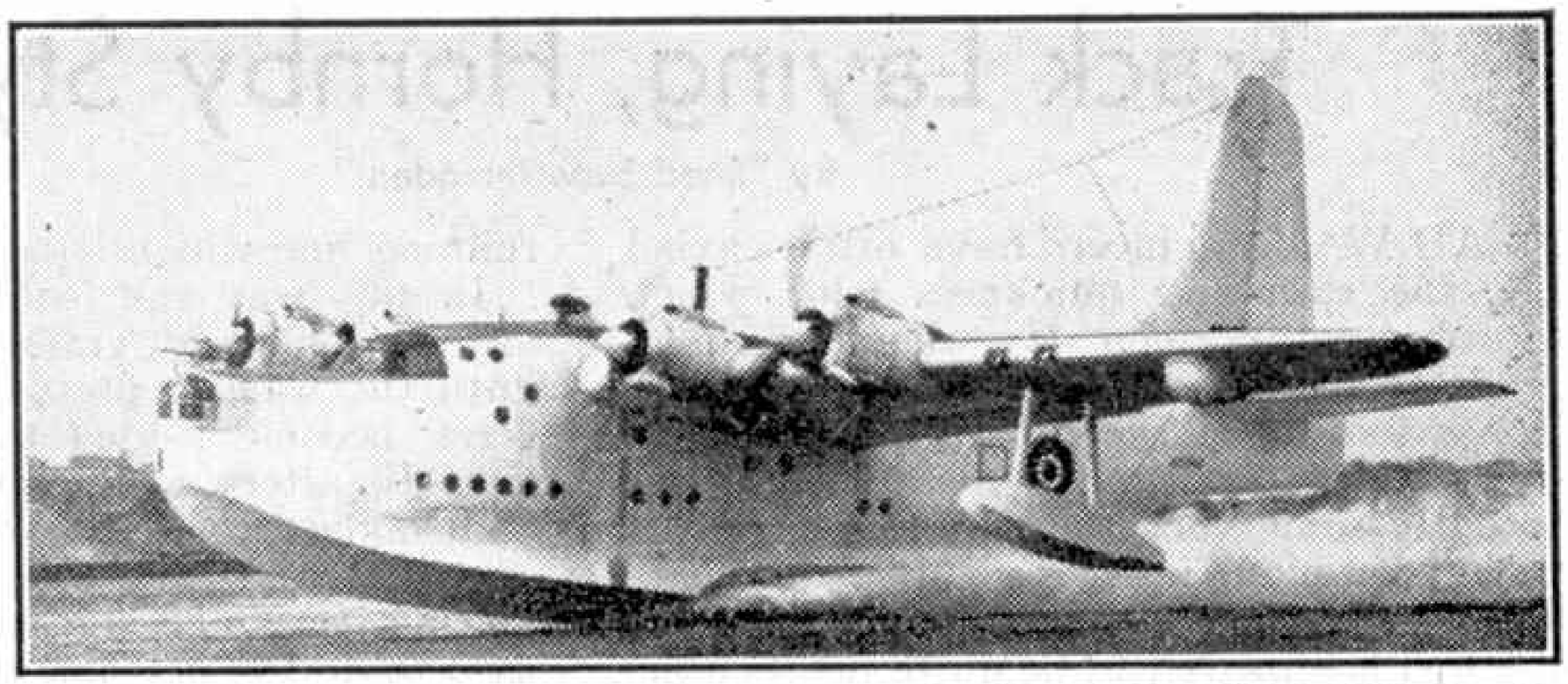
Lockheed Transcontinental Records

All three types of Lockheed aircraft in production to-day have at least one U.S. transcontinental speed record to their credit, a situation also believed to be a record. The three types of machines are the "Neptune" P2V patrol bomber, the 4-engined "Constellation" transport and the jet-propelled P-80 "Shooting Star" fighter.

The most recent success is that of a "Neptune" of the U.S. Navy which on 28th May last made an East to West flight across the United States in 9 hrs. 23 min., a new official NAA record. The flight was made in bad weather, but even so cut more than 29 min. from the previous official NAA record, held since 1938 by Major Alexander de Seversky.

The West to East official NAA record is held by a Lockheed "Constellation" of Transcontinental and Western Air, Inc., which on 3rd February last flew non-stop the 2,474 miles between Burbank and New York in 7 hr. 27 min. The air liner had 52 passengers on board.

Surpassing all other American speed records was the performance of the Lockheed P-80 "Shooting Star" that on 26th January this year flew non-stop from California to New York, in 4 hr. 13 min. This flight, an unofficial record, was made at an average speed of 584 m.p.h.



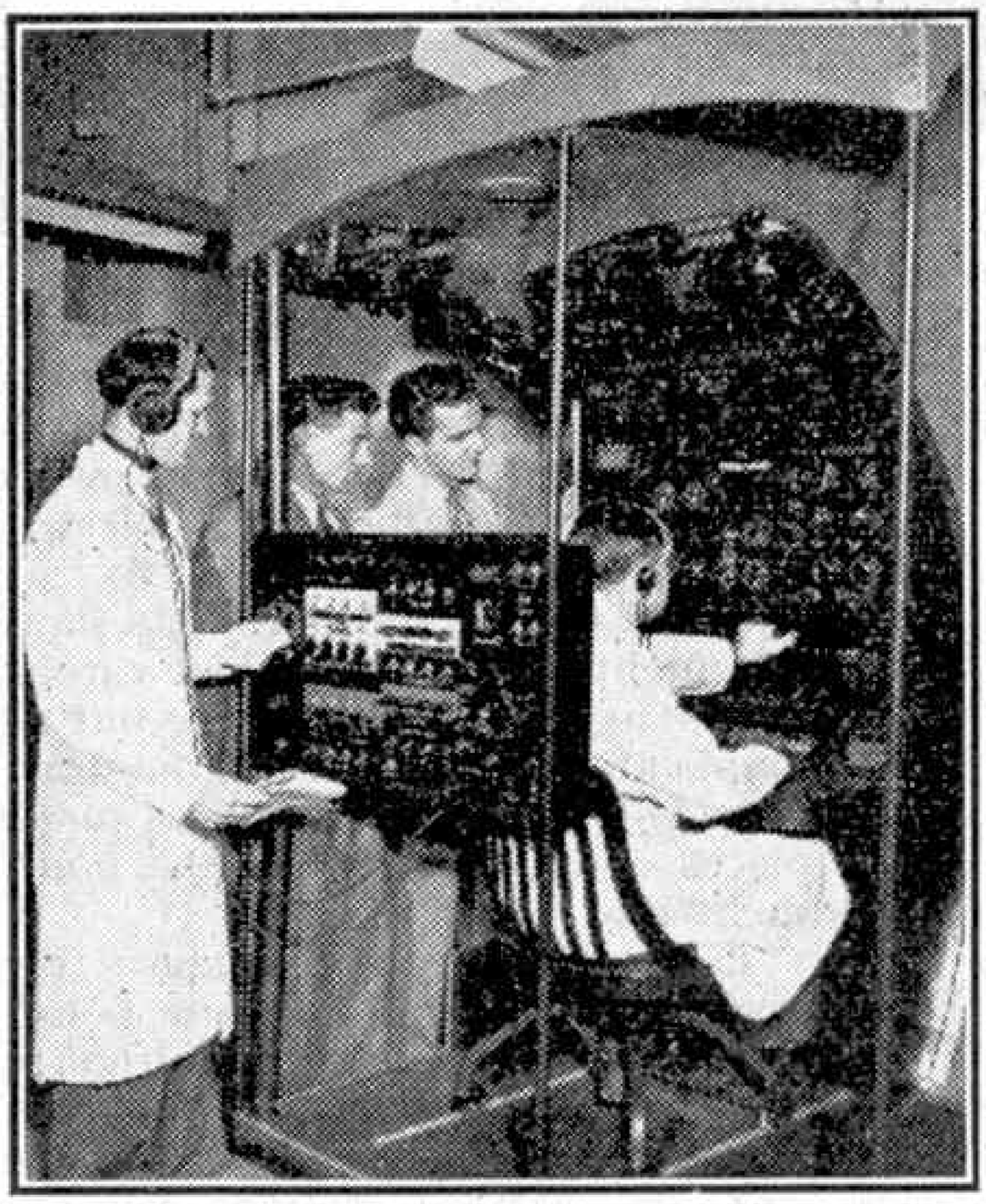
The Short S.45 "Seaford" I, originally known as the "Sunderland" IV. It is heavily armed. A civil version called the "Solent" and equipped to carry 36 day passengers or 24 day-and-night passengers is in production for British Overseas Airways. Photograph by courtesy of Short Bros. (Rochester and Bedford) Ltd.

Britain's Air Liners of the Future

Although many of the civil air liners now in production in this country are superior to any other machines in their class, anywhere in the world, Mr. John Wilmot, the Minister of Supply, recently announced that they must all be regarded as purely interim post-war machines. Before long they will be superseded by even better air liners, all of which will have either jet or gas turbine engines.

It was stated earlier this year that production Bristol 167 "Brabazon" Is will have gas turbines. Now it is known that the second prototype Airspeed "Ambassador" (Brabazon IIa) will also be fitted with four of these power units, which are usually referred to as "propjets." The Brabazon IIb, which is a twin-engined Vickers machine developed from the "Viking," will have two 1,000 h.p. propjets and should be finished next year. It will carry 24 passengers and, like the "Ambassador," is intended for use on air routes to the Continent. The Brabazon Type III is a four-engined air liner, weighing 90,000 lb., being built by A. V. Roe, and probably will be named "Tudor" III. Four propjets are expected to give this machine a speed of 375 m.p.h., but it will be several years before it is flying.

One of the most interesting of the new machines is the de Havilland 106 Brabazon IV, which will be a swept-back wing, tailless mailplane and will fly mail to America at speeds of over 500 m.p.h. Finally, both the Miles "Marathon" (Brabazon Va) and the de Havilland "Dove" (Brabazon Vb) will be re-engined with propjets, which will considerably enhance their already fine performance. J.W.R.T.



An instructor demonstrating the new Lockheed flight engineer trainer, at the company's service training school, Burbank, U.S.A. Photograph by courtesy of the Lockheed Aircraft Corporation, U.S.A.

Portable Flight Engineer Trainer

The lower photograph on this page shows the new portable flight engineer trainer at the Lockheed service training school, Burbank, U.S.A. This equipment duplicates the flight engineer's station in the big Lockheed "Constellation" transport, and, it is claimed, reduces by half the air training time of student flight engineers by enabling them to be taught without costly flight tests. It is also valuable in acquainting other crew members with the flight engineer's duties, which include responsibility of engine operation and control, fuel flow, electrical operations, air conditioning and the pressurising system for the cockpit and cabin.

* * * *

Following the lead of the Royal Air Force, both Eire and Portugal plan to train their service pilots on the Miles "Magister." The Eire Army Air Corps has ordered 12 of these well-known little two-seat monoplanes and the Portuguese Government 10 of them. Both countries already use Miles "Martinets" for high-speed drogue target-towing duties.

Track Laying, Hornby Style!

By "Shed Superintendent"

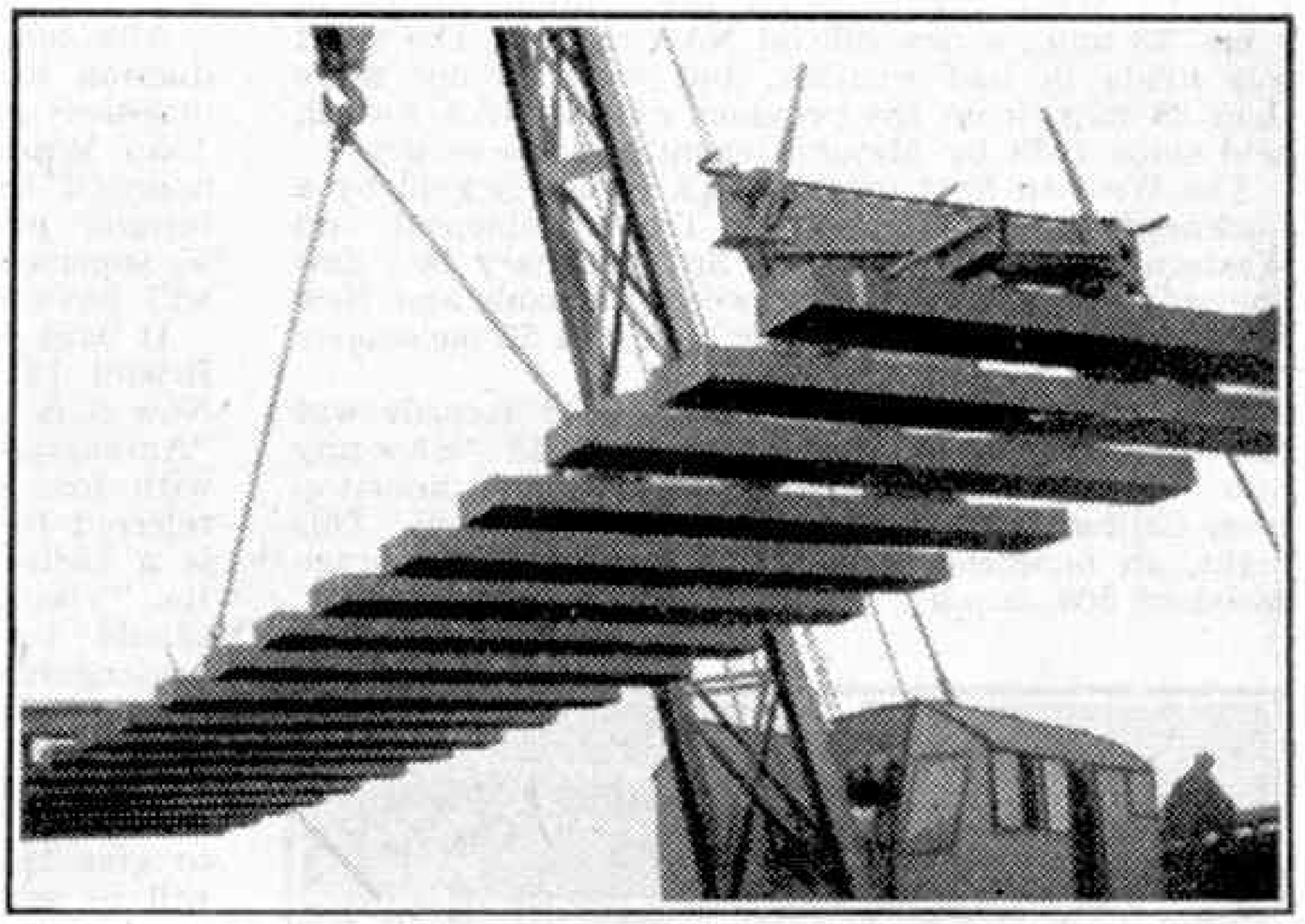
RAILWAY engineers have often envied the ease and quickness with which Hornby railwaymen lay their track in ready-made sections. On full-size railways it has long been the practice to assemble the sleepers and rails on the spot, but recently some very successful experiments have been made in laying "pre-assembled" track by the main line companies and this method has proved to be quite practicable.

Depots have been established where the track is laid out on the ground, in 60 ft. lengths, the spacing of the sleepers being set to marks. The chairs, rails and keys are fixed and the complete lengths are loaded, in tiers of six pieces, on flat wagons. To prevent the lengths of track from sagging when they are lifted, a special beam is attached to the crane hook. This beam has hand-operated catches at each end, which clip under the rails. These catches can be seen in the photograph. For the lifting work small steam cranes are used, and these can run up and down the line in order to transfer the lengths of track speedily from one place to another.

When a section of running line is to be relayed, a "Possession" is taken of two tracks—if there are four lines, so much the better, as traffic can continue on two lines. The steam crane runs on the line adjacent to that being relaid and first of all lifts out the old track, in complete lengths, and dumps it on empty flat wagons. Immediately a length has been lifted out, a squad of men sets to work to fork over the ballast while the crane is fetching a new length of track from another wagon. This is carefully lowered into place until the end of the new piece butts up against the rail-ends of the old, whereupon the catches are let go, and another gang of men fastens up the fishplates and makes the track-circuit bonds.

If the rail is on a curve, the new pieces are brought to the site in straight lengths and slewed over to the necessary curvature, the correct alignment being secured by taking measurements from the adjacent running line which is not being relaid.

In this way the loads of track on the flat wagons are gradually interchanged until the wagons previously carrying new track become loaded up with old track, which is afterwards returned to the Depot and taken to pieces, the sleepers being scrapped and the rails used in sidings. During the relaying work an engine is used to do the necessary shunting, and the movements are all planned to a time-table, a special chart being supplied to the Foreman on which every piece of track is numbered for reference.



A length of pre-fabricated track being lowered into position.

The Southern Railway in particular are finding this system of track-laying of great benefit in suburban areas where, owing to the density of traffic, both electric and steam, it is not possible to get "Possession" of the line for more than short periods at night. With the aid of careful planning that is necessary to carry out all these complicated movements in the dark, it has been found possible to lay as many as 24 pieces of 60 ft. between the hours of midnight and five a.m.

It is not possible to reproduce the Hornby system of laying complete points and crossings, for obvious reasons, although these are partly finished at the assembly Depot, to the measurements of the old track, and the various sections are put together on the site. Pre-assembled track is a success and trials are now being made with 90 ft. lengths.

Life-Saving at Sea

The Wonderful Record of the Life-boat Service

THE progress of the life-boat movement is told in this year's Royal National Life-boat Institution booklet, which has just been published.* The annual issues during the war have been devoted largely to the service that the life-boats have given to seamen of all nations during the period when a relentless human foe was added to the perils of the sea. Now the life-boat service is concerned only with peacetime duties, but the story that is told in the booklet is of the most absorbing interest.

As has been the case with so many great things done in Great Britain, the life-boat service that we know to-day is the creation, not of the Government or even of shipowners or sailors, but of amateurs who saw that here was something to be done and who set themselves to do it. The movement started with Archdeacon Sharp, a Northumberland clergyman who decided to devote part of a charity fund he controlled to the rescue of sailors. For help in his scheme he turned to a London coachbuilder, Lionel Lukin, whose chief ambition was to make boats less likely to sink. Lukin converted a fishing coble into what he called an "unimmergible" boat, and in 1786 this was stationed at Bamburgh in Northumberland—Great Britain's first life-boat.

The next step came three years later, when from their house overlooking the mouth of the Tyne the members of a club saw the wreck of many ships with the loss of their crews. They thought that something ought to be done about this and in 1789 advertised for ideas for a life-boat, offering the princely reward of two guineas for the best suggestion. Half of this magnificent prize was awarded to William Wouldhave, a house painter and teacher of music, who produced a design for a life-boat that would turn right way up again at once if it were capsized. This led to the construction of a life-boat by a ship's carpenter, Henry Greathead, which was called the "*Original*," and rescued her first lives on 30th January 1790, manned by pilots of South Shields.

After the "*Original*" had shown her value Lloyd's voted £2,000 to provide life-boats, and Greathead built 30 of these. It was essential that the work should become the concern of the entire nation, however, and again a deeply interested amateur was successful in bringing this about. This was Lieut.-Col. Sir William Hillary, Bt., who had travelled widely, had sailed round Sicily and Malta in an open boat and had raised a battalion for home defence in the Napoleonic wars. He was practical and eloquent, and when he saw ships wrecked off Douglas, in the Isle of Man, where he had settled, he went out with other men to their help. Then in 1923 he published an appeal for a national service. The result was the founding of the R.N.L.I., to provide a rescue service on a plan that Hillary laid down. He himself continued in service in Douglas Bay, and on one occasion was washed overboard and had his chest crushed and six ribs broken before he was hauled back. He took part in the rescue of over 30 lives and on three occasions won the Gold Medal of the life-boat service. Thus he was not only the founder of the R.N.L.I., but the first and one of the greatest of its life-boatmen.

The further story of the R.N.L.I., an unsurpassed record of bravery and devotion in times of storm and stress, is one that would occupy many volumes. Many readers must have wondered how the comparatively small life-boats can survive in seas that have wrecked much larger vessels. Here in the booklet is the answer. A life-boat has three special qualities. The first is great strength, given her by the English oak, Canadian rock elm and red cedar, Burmese teak and mahogany from Honduras used in her construction. The second is ability to free herself at once of water, through metal flaps or scuppers that open outward when water inside presses against them and close under pressure from the sea, so that a modern life-boat can empty herself in twelve seconds. Finally, most important of all, a life-boat will not sink, however badly damaged, for her spaces are filled with air cases, boxes of red cedar, covered with glue, stretched calico and paint, that keep her afloat even if as many as 20 holes are knocked in her.

Famous veterans of the life-boat service. Robert Cross, G.M., of the Humber, and Henry Blogg, G.C., B.E.M., of Cromer, the outstanding life-boat coxswains of the second world war.

The power given by the engine of a modern life-boat has increased her power of giving service to a remarkable extent. The fleet passed through successive stages of pulling, sailing and steaming, and at last found in the internal combustion engine the ideal form of power, for this engine is not only reliable and efficient, but can be designed to work even when under water. In the 20 years between the two wars the fleet was changed from one of sailing boats into one of motor boats. Now a further change is in progress, for boats with one engine are being replaced by others with two engines each. Thus the need to carry sail for emergencies will disappear, while the use of heavy oil instead of petrol will avoid the risk of fire and double the distance that the life-boats can travel without refuelling. A modern Watson cabin life-boat is 46 ft. long, has a speed of over eight knots and a range of 200 miles without refuelling.

*"*The Story of the Life-boat, 1824 to 1926.*" Royal National Life-boat Institution, Life-boat Depot, Borcham Wood, Hants. Price 1/– post free.*

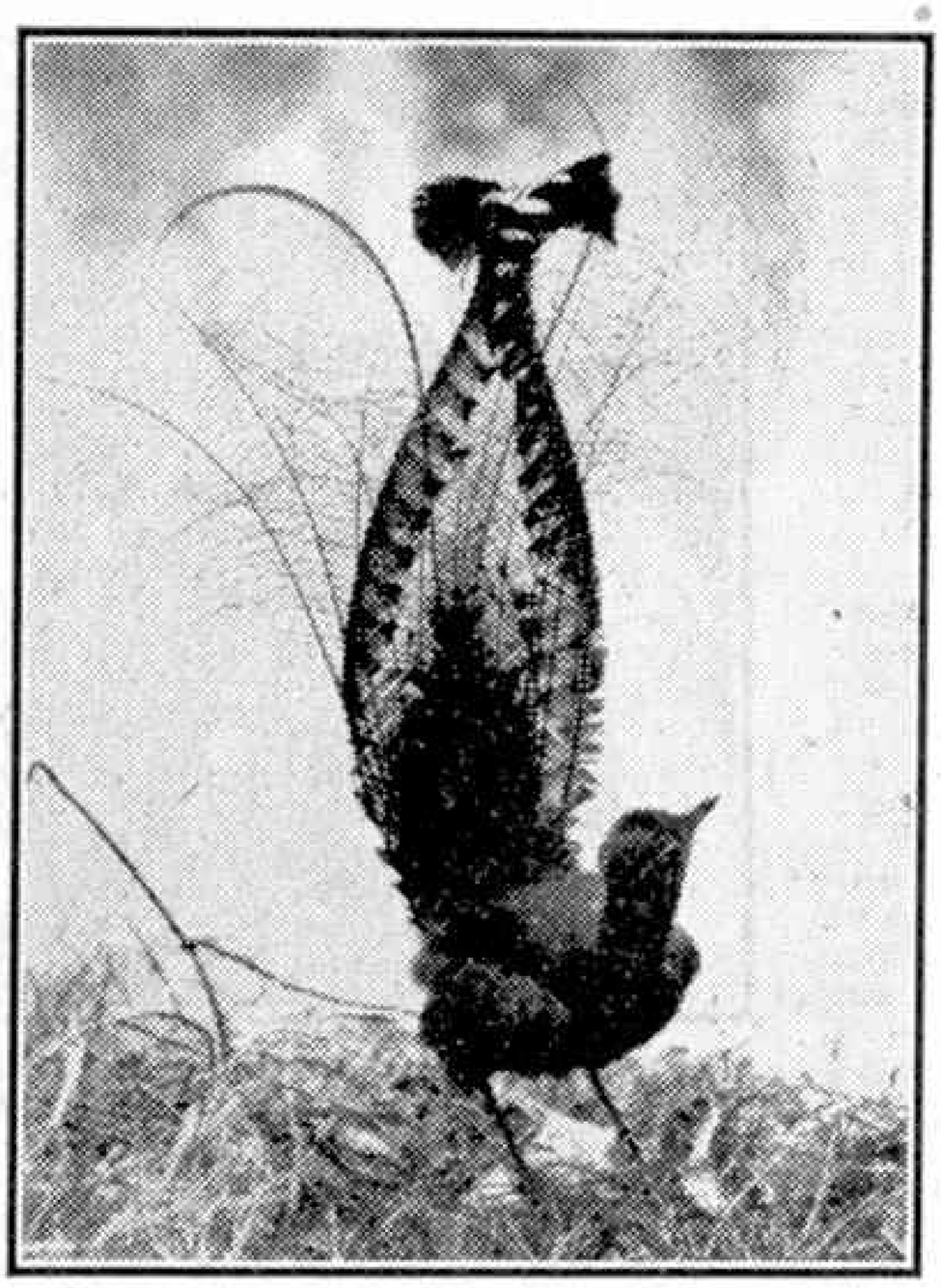
Wild Life Down Under

Nature Wonders of Australia

By Sydney Moorhouse, F.R.G.S.

FEW Zoo arrivals in Great Britain are likely to have more far-reaching results than that of Miss Unity, the 50-lb. baby panda that recently reached London after the long journey by air from Chungking, in China. Already the Zoo officials see, in this success, great potentialities for future developments.

Many animals from distant parts of the world have never been exhibited because of the difficulty not only of transport, but of getting in fresh supplies of essential native foodstuffs. The varied wild life of Australia, one of the richest countries in the world for interesting animals and birds, has hitherto been represented only by the kangaroo, dingo and black swan; but now that supplies of food can be delivered from the jungles and bushes to London in the course of a day or two, it is confidently expected that the near future will see many interesting additions.



Australian lyre bird.

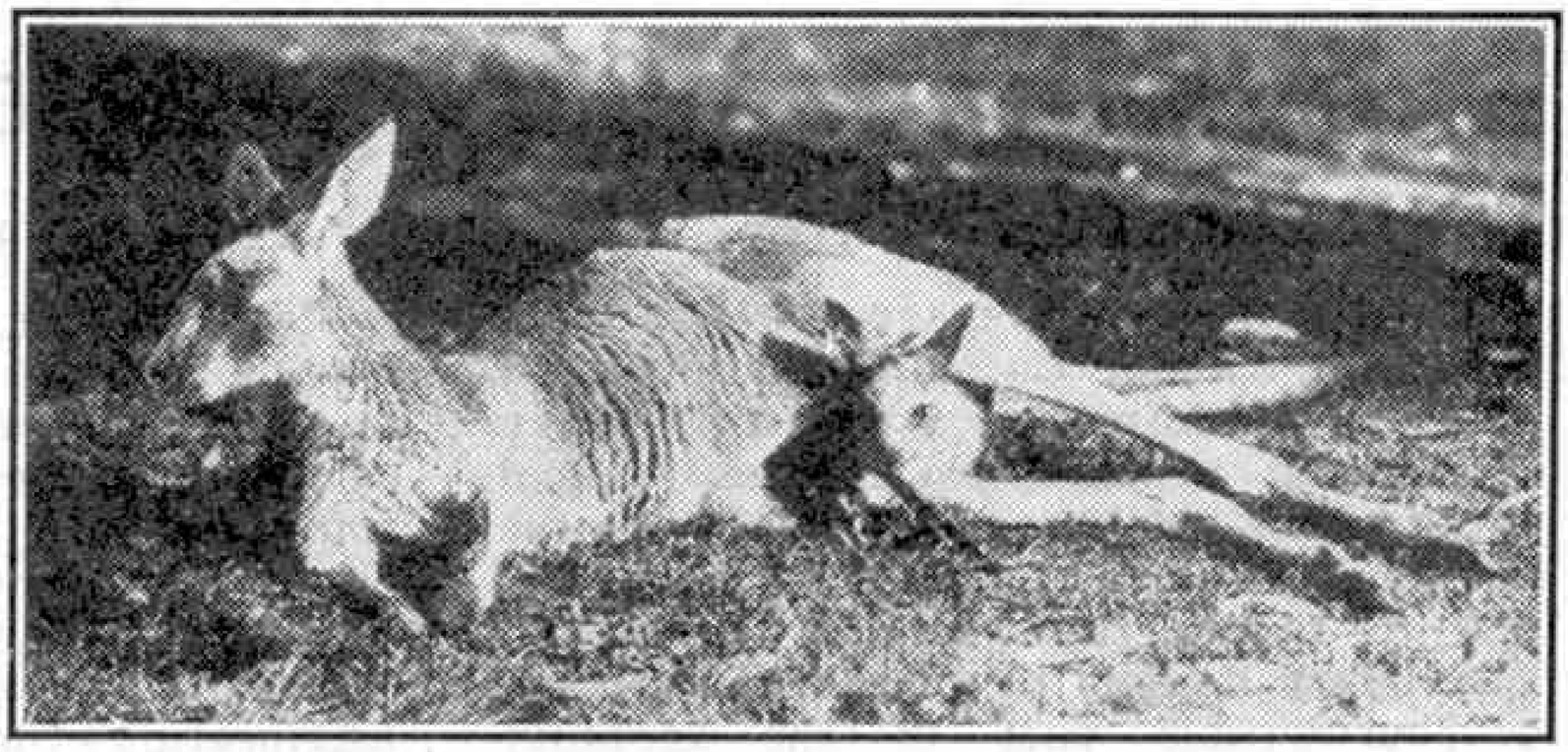
The lovely little Koala bear, which lives only on the leaves of the manna gum of Australia, and is only found in that country, is an example of creatures which future visitors to the Zoo may expect to see, as also are the platypus, the Tasmanian devil, several types of cavies, and other interesting creatures from "down under." Of all these the Koala bear is easily the most fascinating, and it is sad to relate that these solemn-faced, innocent-eyed little creatures are once more threatened with extinction in their native land, and mainly survive in the reserves where the fullest protection is given.

A century ago Koala bears existed in millions all through Eastern Australia, but trapping and disease had brought about a great reduction in numbers by the beginning of the present century. The establishment of wild life reserves in Victoria and Queensland has done much to save the race, but one of the worst features of war, so far as wild life is concerned, is the shortage of manpower and finance available to carry on the work of preservation. As the result the Koala has diminished even in the reserves.

The animals are among the most exclusive of vegetarians and eat nothing but the leaves of the manna gum. But for this it is possible that we might have seen Koalas in our Zoological Gardens before this. The only pair brought to this country some years before the war died because of insufficiency of their natural foodstuffs, and the Australian authorities wisely prohibited the export of any more. If the new schemes materialise, and I see no reason why they should not, then many can look forward to seeing for themselves some of the most fascinating little animals in the whole world.

To watch a Koala bear eating is to marvel at its prodigious appetite, for it devours huge quantities of leaves, all "at one sitting," as though it is uncertain as to when the next meal will be forthcoming. Nature, however, has been kind to the little animal by providing an enormous appendix, from 6 ft. to 8 ft. long, to assist digestion. The animals are mainly nocturnal in their habits and spend the greater part of their lives among the high trees in their favourite bush country. During the day one often sees the old bears asleep among the branches, 150 ft. or more above the ground.

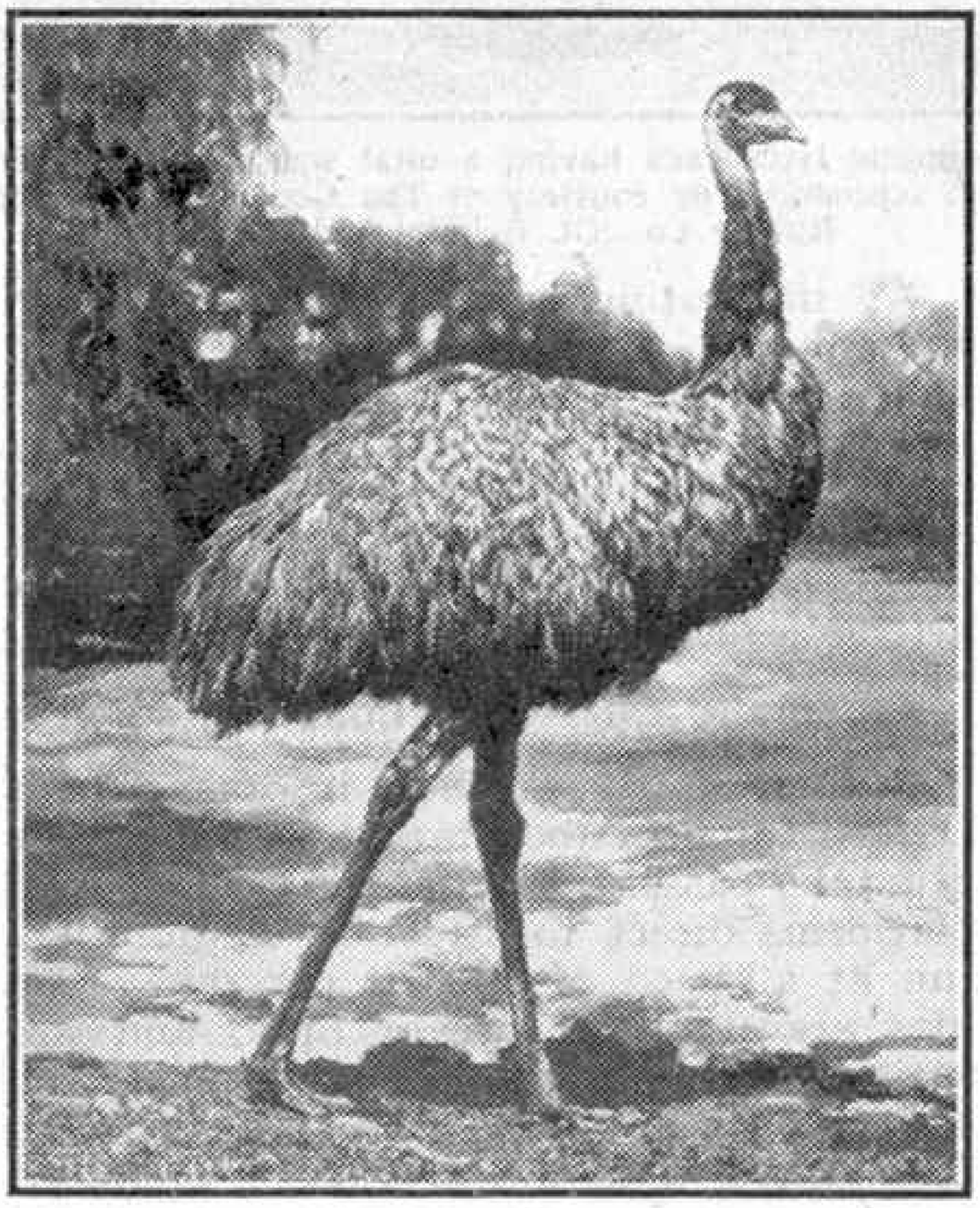
Like the monkey, the mother Koala carries her youngster about with her, nursing it in much the same way as you and I were nursed when young. During movement in the tree tops, however, baby Koala climbs on to its mother's back and rides pick-a-back among the high branches with the same ease as do our British squirrels.



Kangaroo with young kangaroo in pouch.

The Koala has been threatened with extinction on more than one occasion, but the attentions of man have failed entirely to conquer the dingo, Australia's wild dog, which still roams freely over many places in the interior of the country. Like the jackals of Asia, the dingoes roam in packs. They utter dismal sounding howls, for they are unable to bark, so that at night a pack of them sends up a chorus that is anything but pleasant. They share the jackal's cowardice, however, and instances of their making an attack on a human being have been very rare indeed.

Although the dingo has been resident in Australia for thousands of years, it is not an "original" native. The first dingoes are believed to have come with the founders of the Australian race, who arrived from South East Asia some 30,000 years before the first Europeans put in at Botany Bay. This would seem to indicate a close relationship between the dingo and the jackal of India and Burma.



Emu of Australia, one of the world's largest birds. It is about 5 ft. in height, with fine, brownish-black feathers.

Many parks in London and elsewhere now have specimens of the Australian black swan on their ornamental lakes, and indeed some of the birds have become so used to the British climate that they have reared broods. Australia is the real home of the black swan in its wild state, however, and the birds can be seen in large numbers on the estuaries and inland waters throughout the whole of the country. Just as in Britain the call of gaggles of wild geese passing over our towns and cities at night during the time of migration is far from uncommon, so in Australia have I heard the flocks of black swans going overhead, uttering their fluting calls.

Australia's most wonderful bird, however, is the satin bower-bird, which actually paints and decorates the walls of its nest. The brush consists of a piece of frayed bark held in the bill, and the paint of powdered charcoal mixed with saliva. Some years ago one of these birds in captivity at New York Zoo displayed remarkable ingenuity in performing this "painting and decorating" act, despite the fact that no charcoal was available. It plastered its nest with pieces of rotting wood, which it had chewed in its beak and mixed well with saliva!

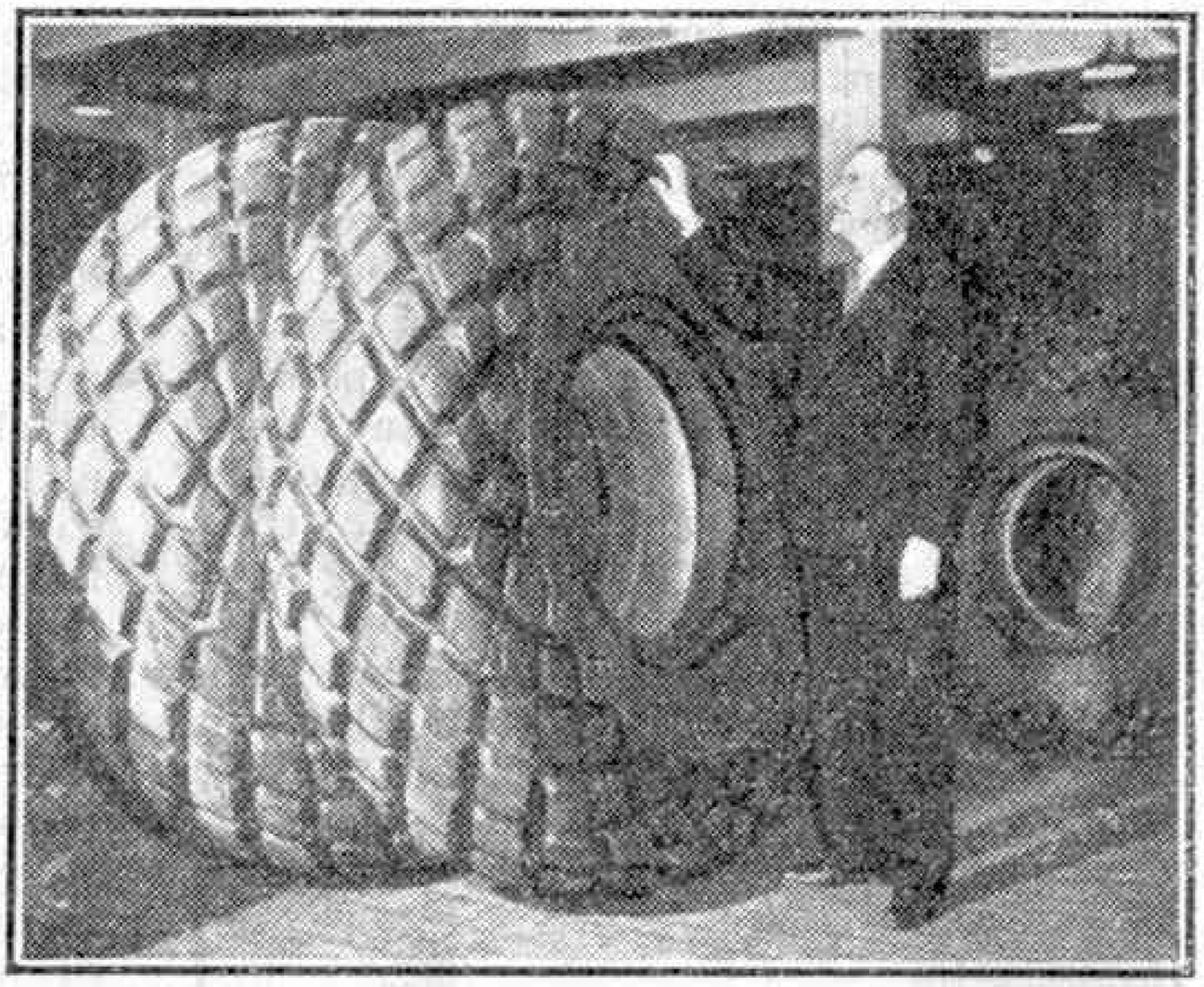
Although the satin bower-bird appears to be the only one that goes in for such an elaborate system of nest decorating, the seven other Australian types all adorn their bowers with bright objects, ranging from flowers and berries to bleached snail shells and the bones of other birds and animals picked up in (*Continued on page 348*)

Engineering Notes

Giant Pneumatic Tyres

More than 25 years ago the Goodyear Tyre and Rubber Co. Limited developed a giant pneumatic tyre for heavy commercial vehicles. With the gradual adoption of this type of tyre it became possible to increase loads and speeds, and to reduce the wear on equipment. The latest designs of these tyres played a considerable part in the mobility of Allied Forces in their victorious campaigns during the world war. Apart from giant aircraft tyres, the company produced also special tyres in very large sizes for use on the bulldozers and other excavating machines used to level sites for airfields, and for clearing and reconstructing roads damaged by the retreating enemy.

Some idea of the size of these giant tyres may be gained from the illustration on this page, which shows Mr. W. A. Hazlett, managing director of the Goodyear Company (Gt. Britain) Ltd., whose height is 6 ft. 2 in., standing beside a tyre of which the assembled weight is 1,794 lb., with the outer cover weighing 1,671 lb. The weight of the inner tube alone is 77.6 lb. The crude rubber required to make each tyre totalled 887 lb. The tyres illustrated are 6 ft. 10 in. overall diameter and 2 ft. 2 in. wide, but they are not the largest made by Goodyear, however, since some tyres for bombers measure 9 ft. 2 in. overall diameter.



Giant pneumatic tyres each having a total weight of 1,794 lb. Photograph reproduced by courtesy of The Goodyear Tyre and Rubber Co. (Gt. Britain) Ltd.

The Severn Bridge

Preliminary work on the foundations of the new £5,000,000 Severn Bridge is now in progress. This great undertaking which, together with the approach roads, will require about five years to complete, will eventually become part of the new London-South Wales motorway and will reduce the route to London by nine miles, while the journey from Bristol to Cardiff will be shortened by 54 miles. Owing to its importance to the South Wales industries and ports the constructional work is to be given high priority by the Minister of Transport and news of its progress will be given on this page from time to time.

Motor Racing in America

Motor racing, which was entirely suspended during the war, is now being resumed, and one of the most interesting events organised so far is the famous 500 miles race run at Indianapolis, in the United States. This year's race was the first since the war, and it was won by George Robson, driving a 3-litre Thorne Engineering Special. Robson's average speed was 114.82 m.p.h.

An interesting feature of the race was the success of European cars, four of which were included in the first seven places. R. Caracciola, the famous pre-war champion driver of Europe, was to have competed, but unfortunately he crashed during a practice run. Robson, the winning driver, was born at Newcastle-on-Tyne.

Automatic Lifts at a London Station

Automatic lifts are now in operation at Oxford Circus Tube Station, London. The lifts take passengers from the Central Line platforms direct to street level and they run at a speed of 500 ft. per min. The lifts are used for ascent only, and are entirely automatic in action. When the lift has been at the landing 18 seconds, an illuminated sign and a voice reproduced from a record warn passengers to stand clear, and the lift gates close. Then the lift ascends to street level.

BOOKS TO READ

Here we review books of interest and of use to readers of the "M.M." With the exception of those issued by the Scientific and Children's Book Clubs, which are available only to members, and certain others that will be indicated, these should be ordered through a bookseller.

"SHIPS"

Edited by Lieut.-Comdr. E. C. TALBOT-BOOTH, R.D.

This is the first number of a new magazine that should be of the greatest interest to all readers of the "*M.M.*" who are attracted by the sea. As its Editor remarks, there are large numbers of people of all ages and in all walks of life who are fond of ships, but have neither time nor opportunity to study official publications about them. For them "*Ships*" will provide information. The aim of the Editor is to make the magazine personal in character and individually helpful to readers, and he hopes to enjoy correspondence with them on all sea matters.

Each issue of the magazine is to contain the history of a shipping company, with house flag, funnel and identification features. In the present number the company dealt with is the Orient Steam Navigation Co. Ltd., and in addition to the story of the company itself we are given the names of Orient ships, with silhouettes and notes on the vessels, some of which were sunk during the war. Other attractive features include ship recognition, descriptions and drawings of important new vessels and miniature ship modelling; while "*Naval Notes*" will record the appearance of new warships and the loss or breaking up of old ones, and give general information on fighting ships and the navies to which they belong.

Lieut.-Commander Talbot-Booth is a well-known authority on ships and shipping, and is the editor of "*Merchant Ships*," the standard volume of information on these vessels. His knowledge of the sea is a guarantee in itself that the new magazine will be well worth the attention of all who love ships. Copies can be obtained by subscription only, the rate for which is 7/6 a year, and any reader of the "*M.M.*" who is interested should write for details to the Editor, "Ships," White Lodge, Nackington, Canterbury, Kent.

"CYCLING MANUAL"

(Temple Press, 1/6 net)

The 20th edition of this publication comes at a time when we may look forward to what will be perhaps the greatest era in cycling activity that this country has known. The work has been revised and modernised with this in mind, and is remarkably full and complete. On the technical side it describes in detail the construction, care and adjustment of every type of machine and accessory, providing the information required by both novices and experts. Track and road competitions, record breaking, camping, touring and weekend jaunts all receive attention, and it is good to find that the cyclist who uses his machine almost entirely as a ready and useful means of transport is not overlooked. There is full information on the regulations that affect cyclists, with many valuable tables, and details of track and road records.

The manual is amply illustrated, with a wealth of useful diagrams illustrating adjustments and repairs and will be found invaluable by all cyclists.

"DOCAS"

By GENEVRA SISSON SNEDDON
(Harrap, 6/– net)

This is an unusual children's story. The scene is set in California in the days when the pioneers were flocking to that State in search of gold, and it deals with the lives of the Indian natives and with the Spanish missions that had been established there by priests making their way northward from Mexico. Thus it covers the period when California was being transformed into a part of the United States of America.

Docas himself is an Indian boy, whose fortunes we follow with those of his family, first living independently and then in one of the Spanish missions. The tale is told in 50 little scenes, which make up a connected series and were originally written to provide reading matter for children at a University school. Going through them it is easy to realise how delighted these children must have been with each new instalment as they read it, and now that they have been collected in book form they will provide delightful entertainment for children all over the world. They have the further merit of presenting an accurate picture of life in California 100 years ago. The book is illustrated by an excellent series of spirited drawings.

"NAMEPLATES OF THE SOUTHERN LOCOMOTIVES"

By F. H. A. BURRIDGE
(Sydenham and Co. Ltd. 1/6)

It might be thought that one S.R. locomotive nameplate must be like another, but when they are presented individually, as in this publication, it is realised that they show a pleasing variety.

The "Merchant Navy" 4–6–2s are outstanding in this respect, with nameplates that include replicas in colours of the house flags of the shipping lines represented. Descriptions and dimensions of these plates are given here, with the corresponding heraldic and other decorations on the "West Country" 4–6–2s. Nameplate lore of the "Nelson" and "King Arthur" 4–6–0s, the popular "Schools," the ex-L.B.S.C. "Remembrance" and "Atlantic" classes, and even the gay little tank locomotives that work so hard in the Isle of Wight, also provides very interesting reading. Lettering styles and other items are included, and there are many excellent illustrations.

"THE FIRST RAILWAY ACROSS THE BORDER"

By GEORGE DOW, A.M.Inst.T.
(L.N.E.R. 2/6)

To mark the centenary of the opening of the first section of the former North British Railway, the L.N.E.R. have issued an attractive booklet entitled "*The First Railway Across the Border.*"

This Border story is divided into four chapters, dealing respectively with the general history of the lines, its engineering features, its early locomotives and rolling stock, and finally the progress of North British affairs up to grouping.

The booklet contains maps and diagrams, and many interesting illustrations, well selected and reproduced.

Copies of the book can be obtained from the Advertising Department, L.N.E.R., Pancras Road, London N.W.1.

"MARINE MODELS"

(Hutchinson. 1/6 net).

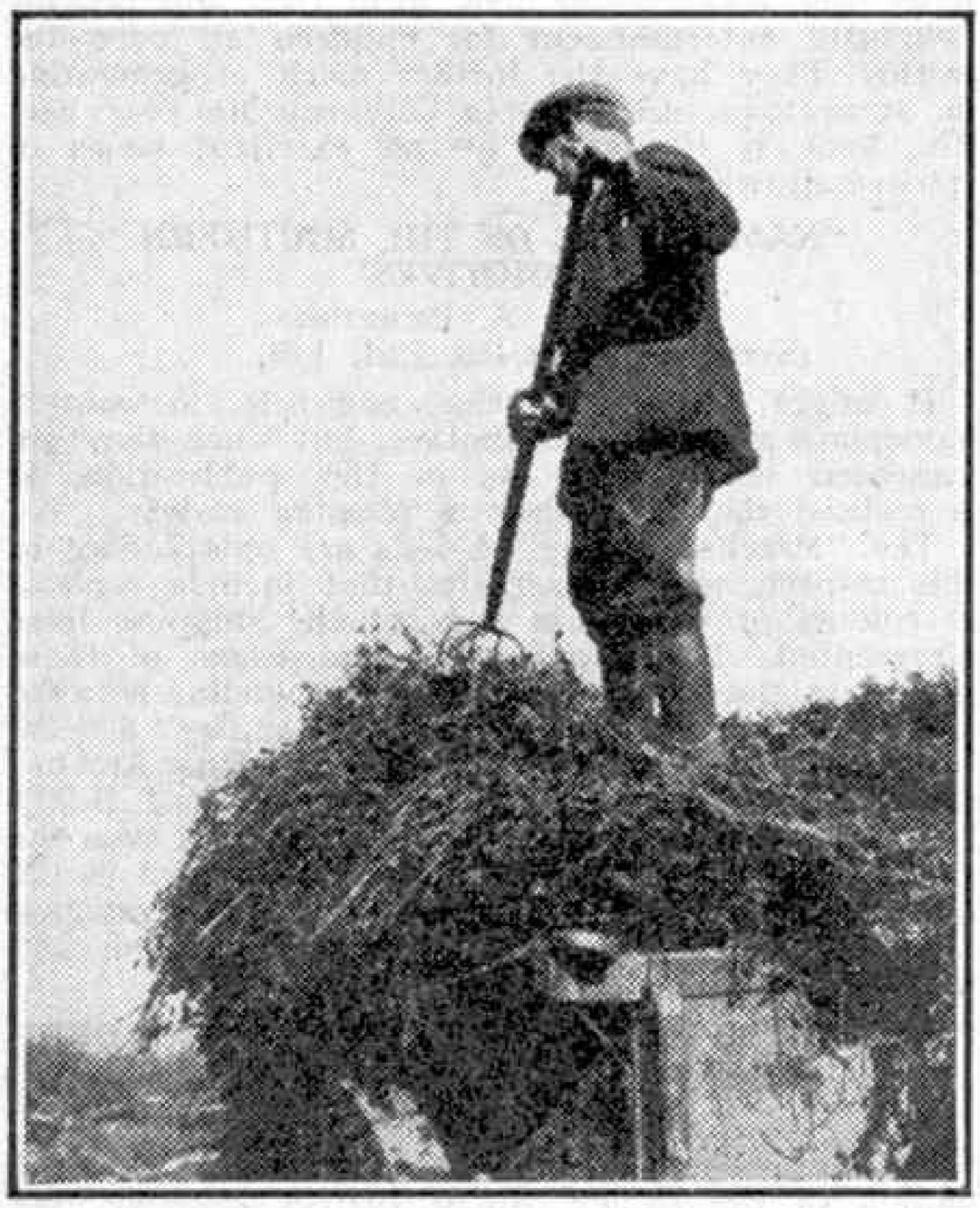
We have just received the first post-war issue of "*Marine Models*," which suspended publication six years ago, when model-building as a craft went to war. Now model-builders can return to the interests of peacetime, although they are still handicapped by shortage of materials and other difficulties. The resumption of publication of "*Marine Models*" is therefore timely, and judging by this first post-war issue the magazine will be as valuable as ever to those who build model boats and ships, and indeed to all who are interested in this craft.

Articles in this issue deal with the construction of a 30-in. model yacht, the building of show case ships and the practical application of marine models, and there are many notes of practical interest, with excellent pictures and diagrams.

Photography

People at Work

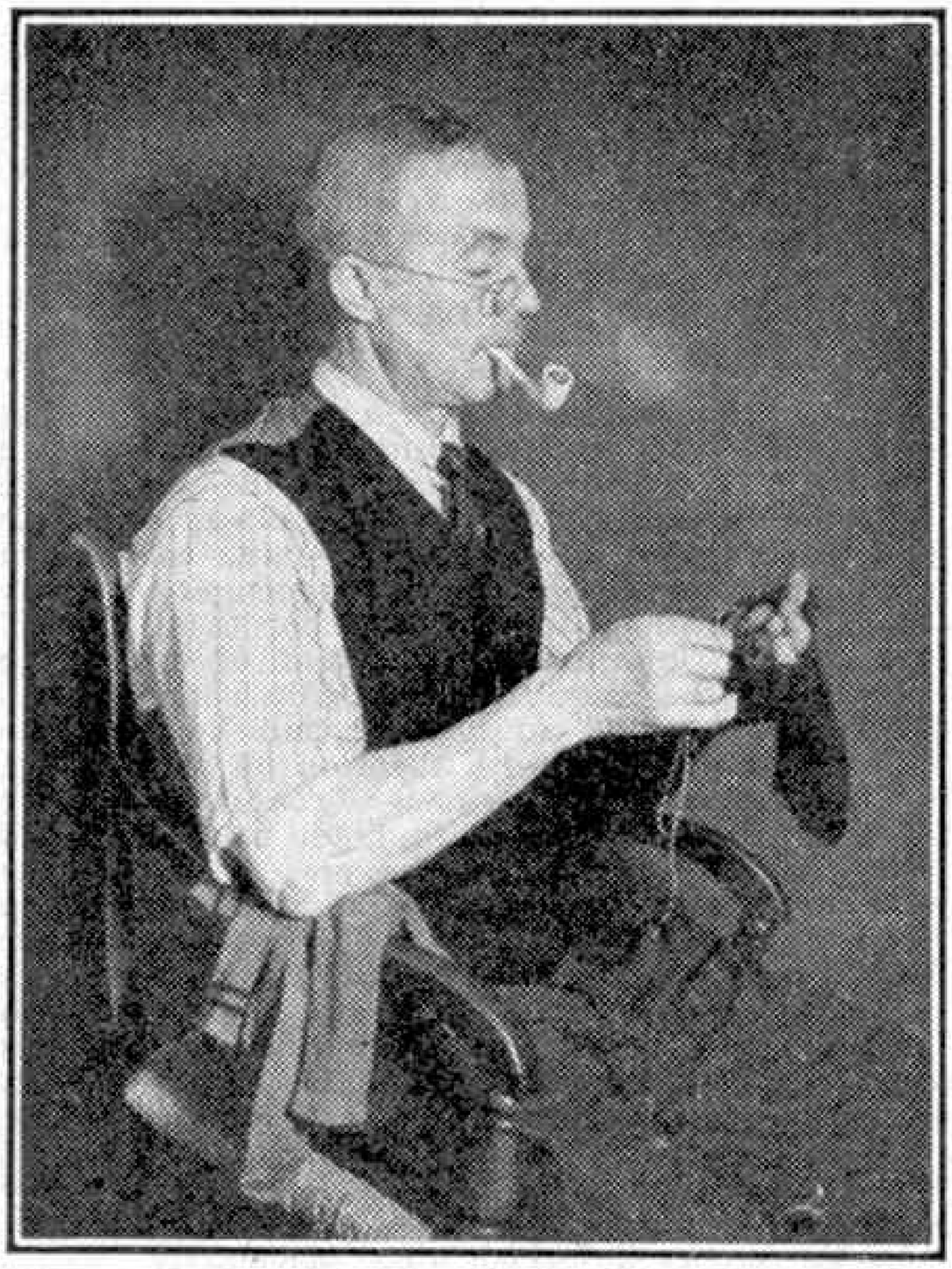
PEOPLE engaged in a job of work different from our own seem to possess a fascination for most of us. Photographers on the look-out for novel subjects and who know how to make the most of their chances will find it great fun to make a collection of "people at work" pictures.



Loading beans. Photograph by J. R. Tottle, Taunton.

A small hand camera is ideal for such work. If possible it is best to walk about with the camera "at the ready." If the light is good set the lens at f.8 and the shutter time at 1/50th sec., and if the camera is one of the popular type in which focussing is done by rotating the lens mount, set this at 15 or 20 ft.

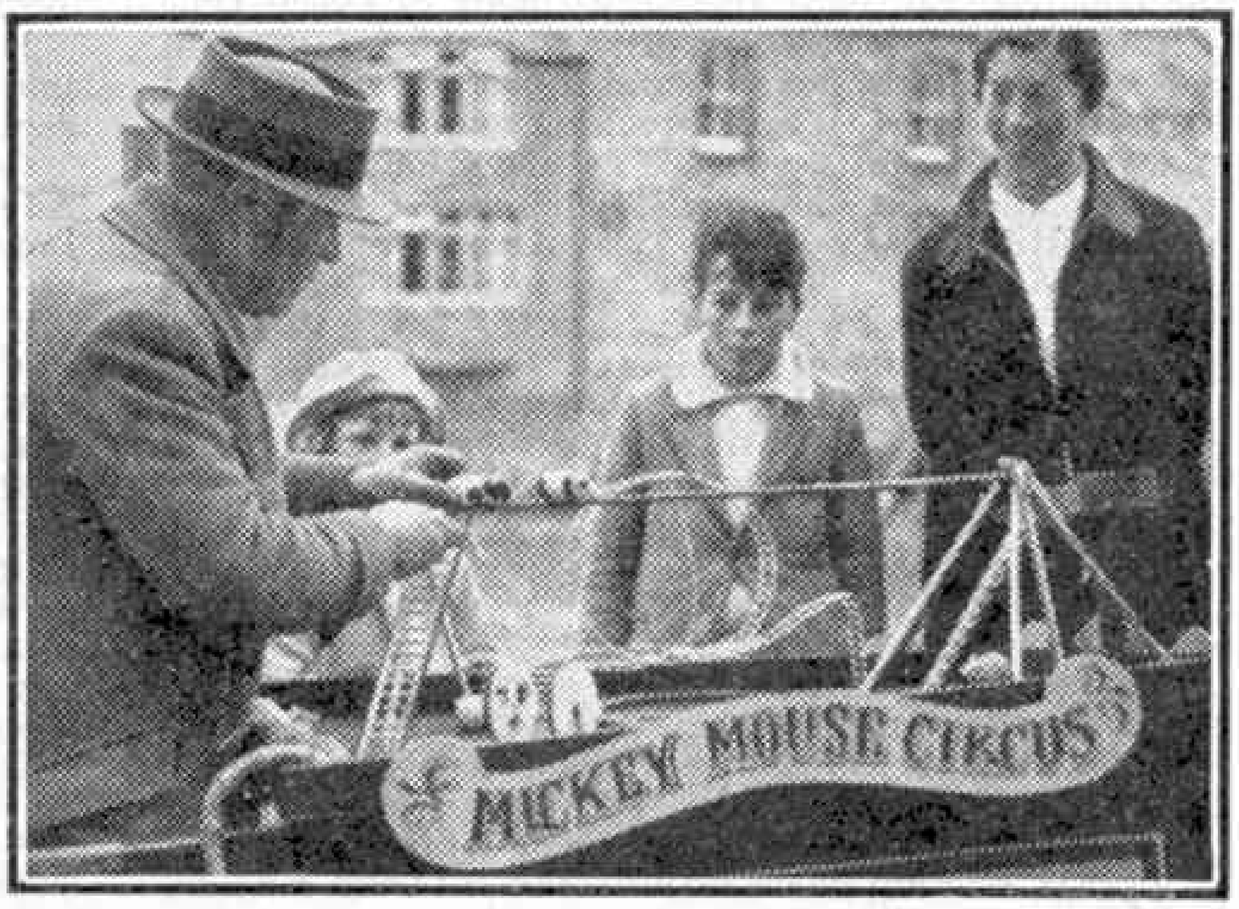
The possible subjects are many and varied. Gangs of road makers in action will provide an excellent variety of pictures. I have seen many effective photographs of this kind, and usually there is ample material at the scene of operations for several "snaps" without moving one's position more than a few feet. Workmen breaking up the road with pneumatic drills or picks, others tending the tar boiler and pouring tar, the steam roller and its driver—all these offer scope for the camera.



The widower. Photograph by Miss Pennethorne, Haywards Heath.

Window cleaners or house painters at work on ladders can often be snapped without trouble. In most towns flower sellers are to be seen in the main streets offering their wares to passers by. A little patient "stalking" of the flower seller will generally bring a chance of snapping her against a background free from traffic.

It will not take long to make a really good collection of pictures of this type.



The tight-rope walkers. Photograph by S. S. Pethybridge, Newton Abbot.

Club and Branch News

WITH THE SECRETARY

WINDING UP THE SUMMER PROGRAMME

With the coming of August we are nearing the end of the outdoor season, and an effort should be made to arrange a good climax in the form of a special outing, planned perhaps on a larger scale than most of those held during the summer, or of a sports meeting. In some instances a garden fete can be arranged, and this should certainly be done if a suitable place for it is available, as an event of this kind provides such a splendid opportunity for the parents and friends of members to assemble and to learn something of what the Club is doing. A garden fete has the further advantage that a small charge can be made for admission, and side shows and refreshments also can be made good sources of revenue with which to improve the position of the Club in preparation for the activities of the coming Winter Sessions.

START A MAGAZINE

I have been interested recently to read in one report after another of the publication of Club and Branch magazines. An elaborate printed magazine may be out of the question just now, but it is always possible to produce a simple form, perhaps typed or run off on a duplicating machine of some kind, so leaders of Clubs in which nothing of this kind has yet been tried should keep the idea in mind.

The ideal Club magazine includes notes on recent events and a programme of forthcoming attractions, with perhaps a talk by the Leader on Club work in general. This can be supplemented by articles on model-building and railway topics, and with general contributions from members, including humorous stories and puzzles. Conditions for the production of such magazines should improve during the coming winter.

PROPOSED CLUBS

BROMBOROUGH—Mr. H. L. Cockle, 1, Glyn Avenue, Bromborough.

UTTOXETER—Mr. W. G. Hunt, Philips House, Denstone College.

GILLINGHAM—B. Watts, 201, Balmoral Road, Gillingham.

SHIRLEY—Mr. R. G. Parker, 44, Hazeloak Road, Shirley, Nr. Birmingham.

LONDONDERRY—R. Bolton, 49, Marlborough Road, Londonderry.

LEICESTER—B. Smith, 29, Sibson Road, Birstall, Leicester.

HEMPSTEAD—Mr. R. L. Waghorn, 19, Belmont Road, Hemel Hempstead.

MILL HILL—Mr. R. M. Smart, 2, Holmdene Avenue, Mill Hill, London N.W.7.

ERDINGTON—C. D. Smalley, 25, Machine Road, Erdington, Birmingham 23.

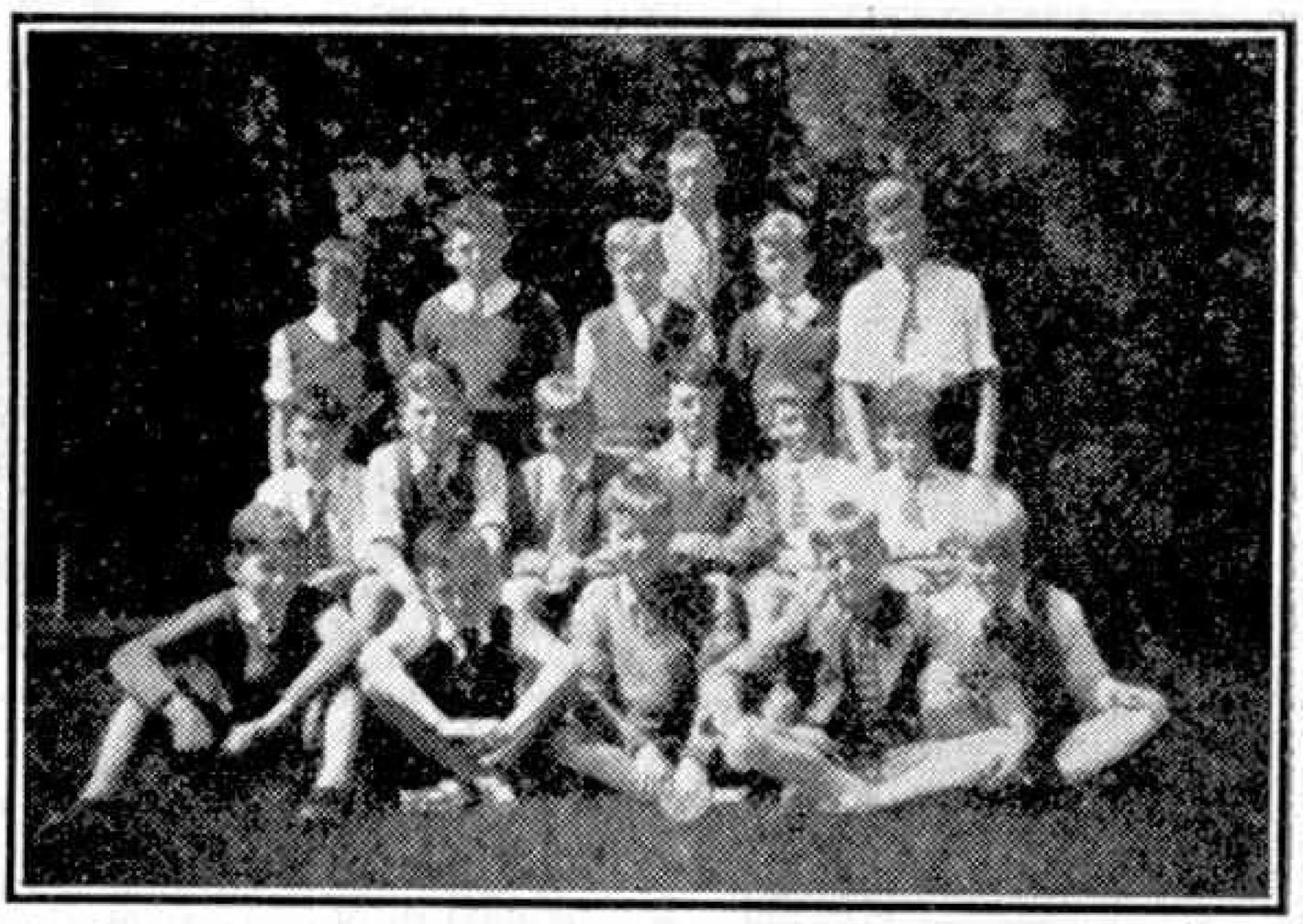
RHONDDA—Mr. N. McIntyre, 8, Craig Terrace, Ferndale, Rhondda, Glam.

FELTHAM—Mr. L. Nash, 191, Northumberland Crescent, E. Bedfont, Middlesex.

CLUB NOTES

COLLEGIATE SCHOOL, WINCHMORE HILL M.C.—There are three working parties at each meeting, two building Meccano models and a third at work on a model station for the Club's Hornby Train Layout. A Whist Drive and Raffle raised £13 for the Club funds. Good Outings are being enjoyed. Club roll: 20. *Secretary:* J. Bartholomew, Collegiate School, Winchmore Hill, London N.21.

BOSTON M.C.—Successful meetings continue, with good Model-building, Film Shows and Games, including Cricket and Clock Golf. Small prizes are presented in Games Competitions. A Club Magazine has been started. Club roll: 12. *Secretary:* P. E. Luff, 103, Woodville Road, Boston, Lincs.



An interesting group of members of the Waterkloof House School Branch, Pretoria, Transvaal. The 17 members seen in it are the foundation members. Mr. W. H. MacRobert, Chairman, is at the rear of the group, and J. V. Mitchell, Secretary, is second from the right in the third row. A fine Hornby Train layout is operated at Branch meetings, and an associated Meccano Club has been formed.

PLYMOUTH M.C.—The Easter Monday Ramble to Kitt Hill was a great success. Events of the Summer Sessions have included a Talk on the old Plymouth M.C. and a Table Tennis match. During the summer Saturday afternoon meetings in the Club room have been given up in favour of outdoor events. Club roll: 45. *Secretary:* D. M. Cundy, 10, Whitefield Terrace, Lipson, Plymouth.

BRANCH NEWS

WHITGIFT SCHOOL (CROYDON)—This Branch, in association with the Whitgift School M.C., is now holding regular meetings for train operations, Sections taking these in turn. Competitions of various kinds have been arranged by Mr. F. Broadbent, Chairman, and the Secretary. A Visit has been paid to the S.R. London Bridge Signal Box. *Secretary:* P. Perryman, 10, Buckingham Way, Wallington, Surrey.

SHEERNESS—At each meeting railway operations are carried out on the Branch track, and both passenger and goods trains are run. A Visit has been paid to the workshop of Mr. L. Taylor, Chairman, where the construction of a 6 in. gauge G.N.R. "Atlantic" was demonstrated. *Secretary:* J. S. Fox, 105, Victoria Street, Sheerness.

Among the Model-Builders

By "Spanner"

MODEL-BUILDERS IN INDIA

Among the many enthusiastic Meccano model-builders in India one of the keenest is Mr. F. D. Aria, Bombay. Mr. Aria has been interested in Meccano and model engineering for many years, and he is in charge of the Meccano section of the Bombay Society of Model-Engineers. This Society was formed in 1940, and its object is the encouragement and development of model engineering and other forms of model craftsmanship. The models shown in the photograph of Mr. Aria include the Grandfather Clock, which has been working perfectly for over three years, and the Mechanical Man. I wish Mr. D. Aria and his Society every success and hope to include further news of our Indian friends on this page in due course.

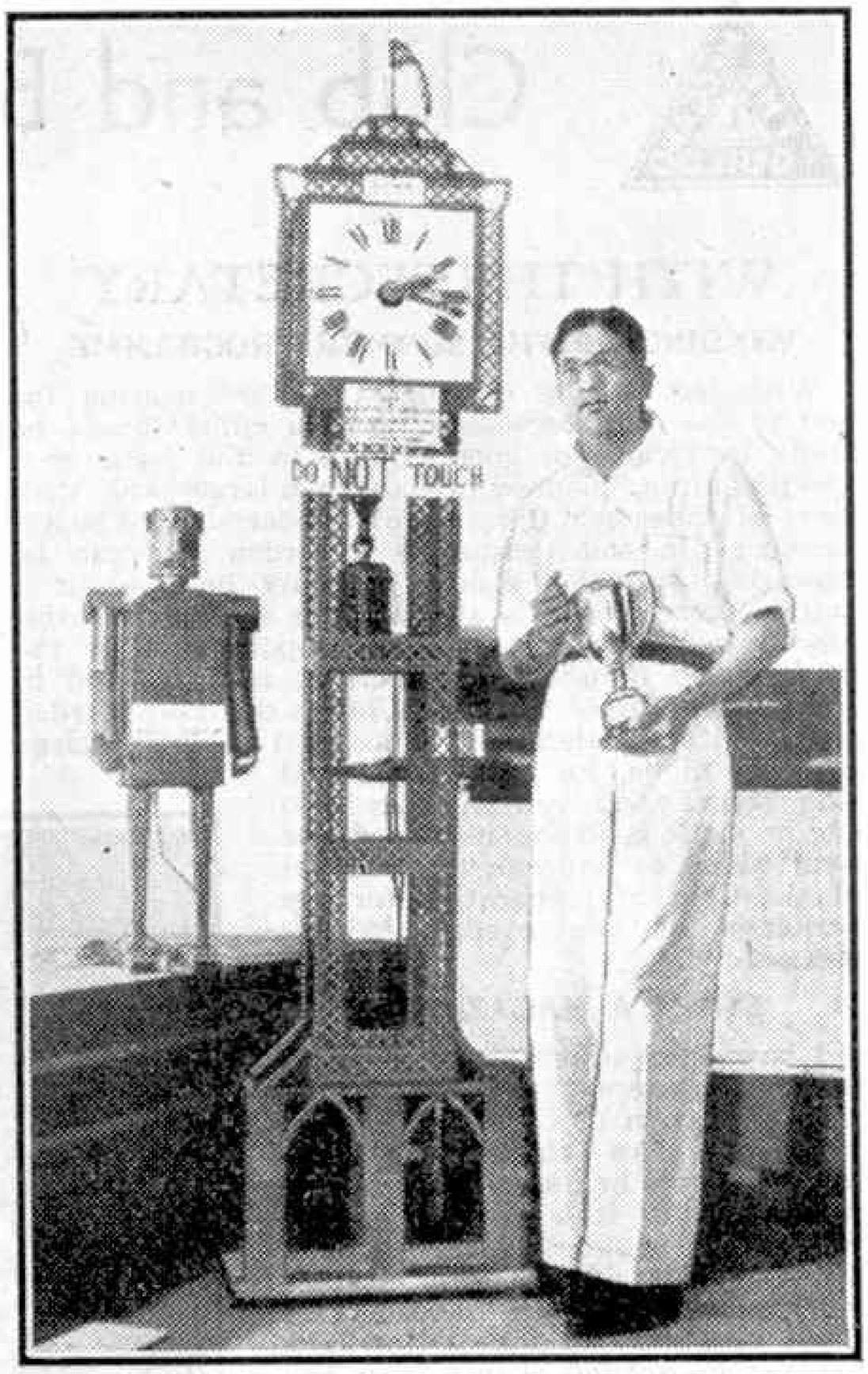


Fig. 1. Two fine Meccano models and their builder, F. D. Aria, Bombay.

John Matthews, Fillongley, near Coventry, many of whose models have been illustrated in the "M.M."

SUGGESTIONS FOR NEW PARTS

Ideas for several additional Meccano parts have been submitted to me recently, and once more I am interested to note how closely many individual suggestions follow those submitted by other readers. Sometimes I have had four or five almost similar suggestions from different contributors. In most cases the ideas put forward are quite sound so far as the usefulness of the parts is concerned but peculiarities of design, with consequent manufacturing difficulties, often prevent the inclusion of the parts in the system. A good example of this is seen in a suggested three-speed Sprocket, put forward by Peter A. Alsop, Cambridge, shown in Fig. 2. A part of this type combining three different sizes of sprockets would occupy less space than three separate Sprockets of the ordinary kind, but it would be difficult to manufacture and would therefore be costly. Also there are very few occasions when a three-speed sprocket chain drive is required in the ordinary run of model-building, so that the demand for such a part would not be very great.

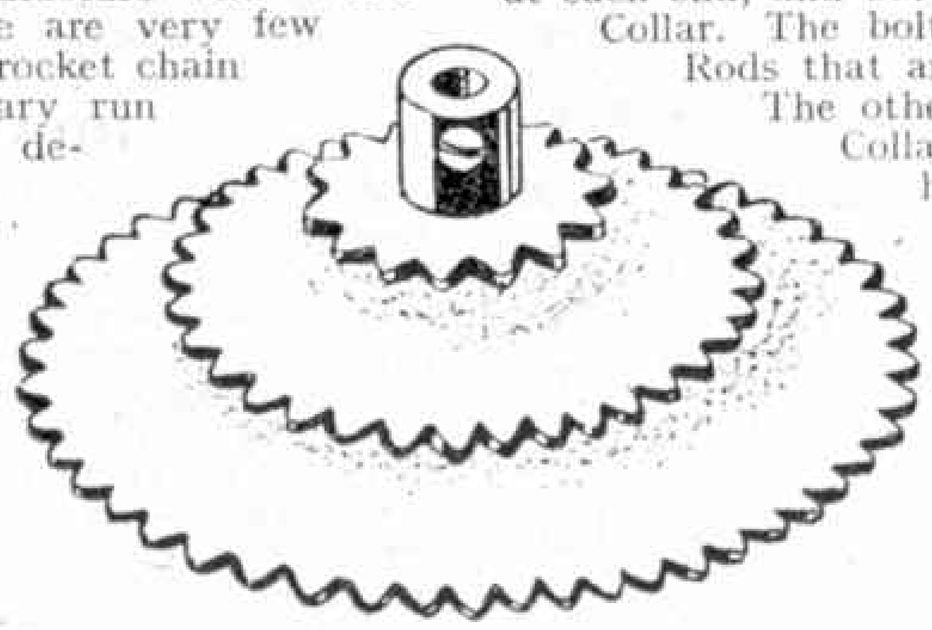


Fig. 2. The three-speed sprocket suggested by Peter A. Alsop, Cambridge.

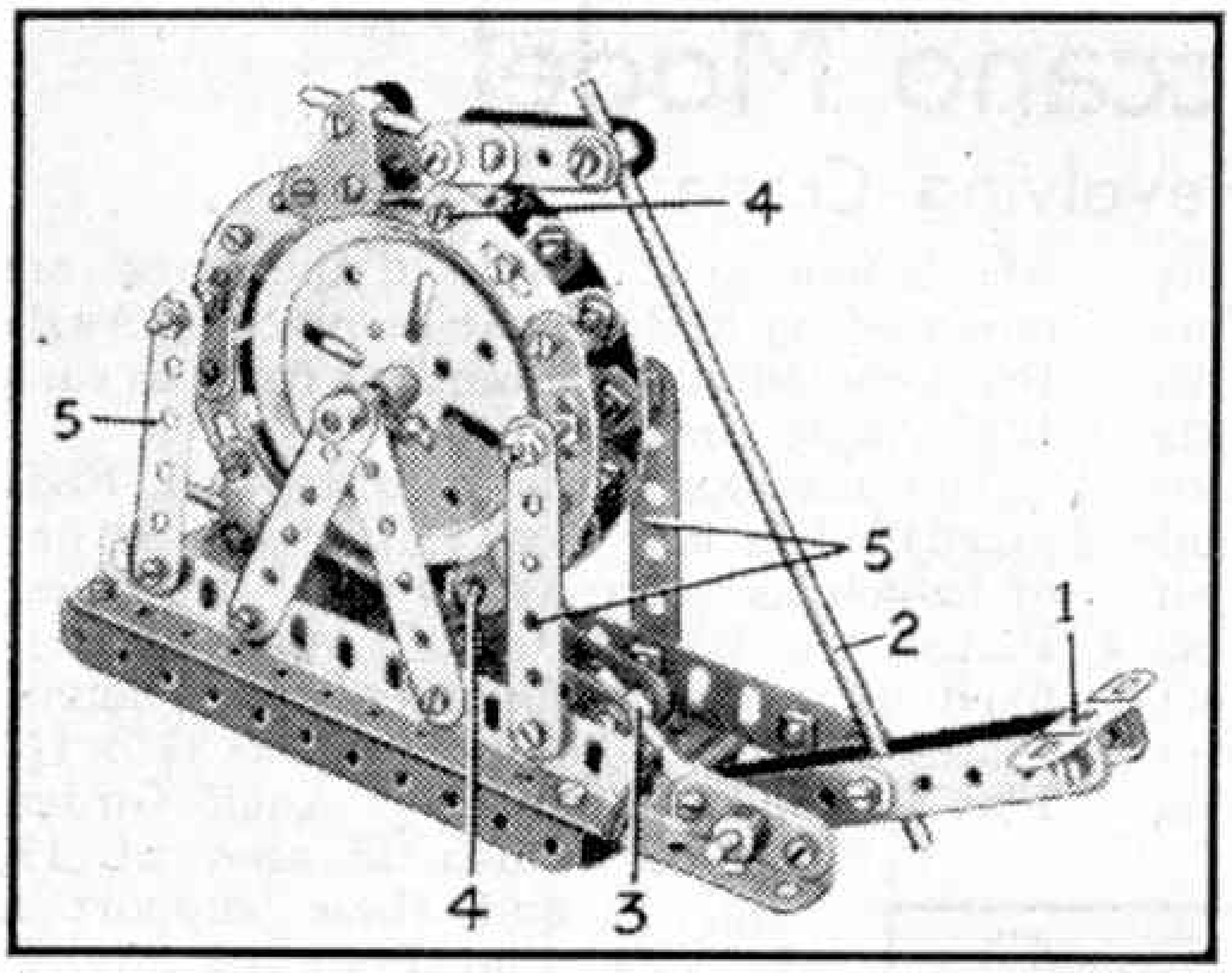
BRAKE FOR WINDING GEAR ("Spanner")

In Fig. 3 is shown a type of external contracting brake that is used to a large extent in colliery winding engines. On account of the large diameter of the brake drum, and the large braking surface, a powerful braking effect is obtained by only light pressure on a foot pedal.

Two Angle Girders are bolted to a $5\frac{1}{2}'' \times 2\frac{1}{2}''$ Flanged Plate and to each of these two 3" Strips are secured to form bearings for a $2\frac{1}{2}''$ Axle Rod carrying the brake-drum, a 3" Pulley.

Four 3" Strips 5 are pivoted to the Angle Girders, and at the upper ends of these the brake shoes are pivoted. Each shoe is formed by fixing two $2\frac{1}{2}''$ Curved Strips together for each side, and joining the two sides by Double Brackets. It is the Double Brackets that come into contact with the 3" Pulley when the brake is applied. Two Screwed Rods are fixed in the centre of each shoe and pass through the upper ends of the Strips 5, to be retained in place by lock-nuts, as may be seen from the illustration. The left-hand shoe is provided with 1" Corner Brackets at each end, and between each pair of Brackets is a Collar. The bolts holding the Collars grip the Rods that are connected to the other shoe. The other ends of the Rods also carry Collars that are pivoted in the end holes of 2" Strips. These Strips are attached to Corner Brackets pivoted at 4 to the right-hand brake shoe.

The two base Angle Girders carry at one end $1\frac{1}{2}''$ Strips that cover the elongated holes and provide bearings for the Rod carrying the operating lever. This lever is made from two $4\frac{1}{2}''$ Strips fitted at one end with Double Bracket 1 and two Angle Brackets to form a foot pedal. The Strips are



A powerful external contracting type brake.

pivoted in the third hole from the opposite end and are held in place by Collars. At the end of the Strips a Collar is pivoted, and this carries the Axle Rod 3, which is held in a further Collar pivoted at the end of the lower pair of 2" Strips. The Rod 2 is connected in a similar manner to the upper pair of 2" Strips, and its lower end is fixed in a Collar pivoted between the 4½" Strips.

When the pedal 1 is depressed, Rod 2 is drawn downward and Rod 3 is pushed up. This movement draws the sets of 2" Strips together and the right-hand brake shoe is pushed forward on the drum, at the same time that the second shoe is pulled over by the connecting rods at the top and bottom. The pressure exerted on the pedal 1 is increased considerably by the lever action so that the shoes can be made to grip the drum tightly.

The illustration shows only the essential working parts of the brake. If used in a model colliéry engine the winding drum would be mounted on the same rod as the 3" Pulleys. A Boiler may be used for the drum.

FOR YOUNG MODEL-BUILDERS
("Spanner")

In building models in which Rods revolve in holes in other parts it is important to make sure that the holes through which the Rods pass are exactly in line with each other. If they are not the Rods will not run freely, and this is especially serious when a small unit such as the "*Magic*" Motor is used to drive the model, as its power may not be sufficient to overcome the excessive friction set up. Fortunately it is quite easy to ensure that all the holes are in line, and to do so it is only necessary to push a long Rod through them and leave it in place while the nuts holding the various parts are finally tightened up.

Sometimes when bolting overlapping Strips or Angle Girders together the holes may get slightly out of line due to springiness in the framework of the model. In such cases the holes should be levered into perfect alignment by means of the Meccano Drift (Part No. 36c) which should be pushed through holes adjacent to those through which a Bolt is to be passed, and then moved to and fro slightly in order to pull the bolt holes into line. The Bolt can then be slipped through easily. The Drift is a tool that should be in the possession of every model-builder.

Special Summer "Puzzle Picture" Contest
Good Prizes for Sharp-Eyed Model-Builders

The subject of this competition is the curious picture shown on the right. Close scrutiny of the illustration will reveal that the picture is made up of a number of separate pieces of all shapes and sizes. Actually there are 15 of these pieces, and they are all cut from illustrations of models in the Meccano Instructions Manuals.

Competitors are asked to try to recognise each of the 15 pieces, and to write on a postcard the Manual numbers and the names of the models from the illustrations of which they are cut. This is a much more simple task than it may at first appear, and a careful examination of the illustrations in the Manuals and that on this page will soon result in many of the pieces being identified.

Competitors are warned that the pieces are not necessarily printed in the same angular positions in the puzzle picture as they occupy in the Manuals; some of them may even be upside down! Readers who cannot identify all the fragments should not hesitate to send in their entries. Even if they cannot give the names and Manual numbers of every model represented, they may easily obtain one of the prizes offered, for if no competitor succeeds in identifying all the pieces in the illustration, the awards will be made to the readers who send in the best attempts. If more than one competitor names every fragment correctly, however, the prizes will be given to those whose entries are the most neatly and clearly prepared, and the decision of the judges on these points must be accepted as final.

The Contest is open to readers living in any part of the world, and there is no age limit. Each competitor is allowed one attempt only. The chief prizes to be awarded are as follows. First, Cheque for £2/2/–; Second, Cheque for £1/1/–; Third, P.O. for 10/6. There will be also five Consolation Prizes of 5/–.

The closing date for receipt of Home entries is 30th September, but the Overseas Section will remain open until 31st December.

Each prize-winner will be notified by letter as soon as possible after the closing date in each Section, and a full list of the awards will appear in the "*M.M.*" in due course.

New Meccano Model

Mobile Revolving Crane

ACTUAL cranes of the type that forms the subject of our new model this month are used extensively for such jobs as loading and unloading railway wagons and lorries in railway sidings, warehouses and stockyards. In a crane of this kind the entire structure revolves on its own axis, and in the larger types some mechanical means is provided to effect this swivelling movement. In the lighter types, however, the structure is swivelled manually, and it is a crane of this type that is represented by the Meccano model illustrated.

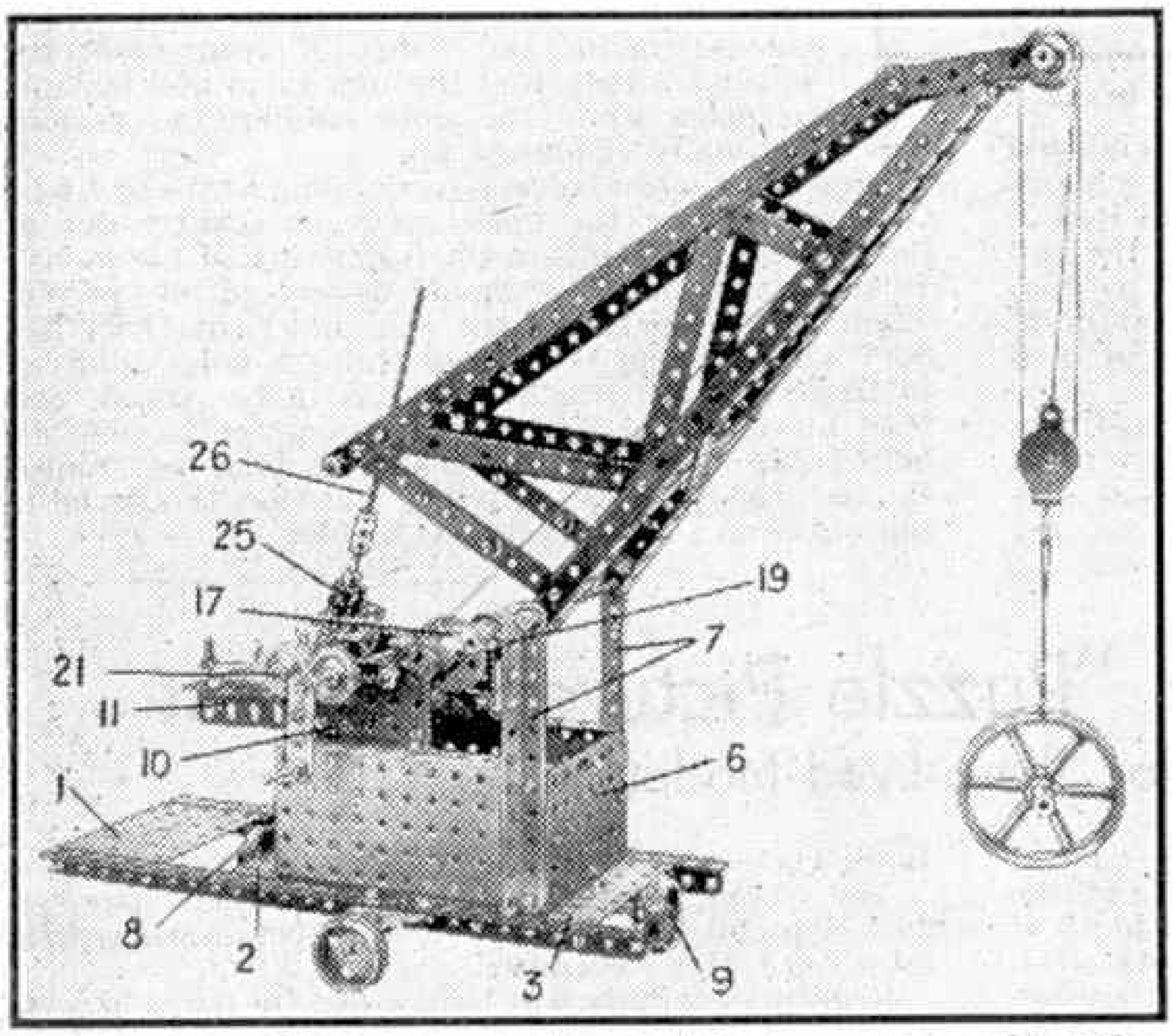


Fig. 1. A revolving crane, equipped with a screw-operated luffing jib, and reversible hoisting motions, all controlled from one handle.

The base of the model consists of two 12½″ Angle Girders bolted to and spaced apart by three 3½″ × 2½″ Flanged Plates 1, 2 and 3, Fig. 1. Bolted to each Angle Girder is a 5½″ × 3½″ Flanged Plate, 4 and 5, Fig. 2, that together form the sides of the superstructure. At the front end these Plates are bridged by a compound 3½″ × 2½″ Flat Plate 6, Fig. 1, formed from two 2½″ × 2½″ Flat Plates overlapped, and to each of them a 5½″ Angle Girder is bolted vertically as shown at 7.

Two of the 3½″ × 2½″ Flanged Plates of the base are fitted with 2½″ Double Angle Strips, in the lugs of which are journalled short Rods that carry 1⅛ Flanged Wheels 8 and 9. The other two wheels, one at each side of the crane, are mounted on a Rod that revolves in Angle Brackets bolted to Trunnions fixed to each 12½″ Angle Girder.

The mechanism is mounted on Rods journalled in two 3″ × 1½″ Flat Plates, one of which is seen at 10 Fig. 1. These Plates are bolted to 3″ Angle Girders fixed to the upper flanges of the Flanged Plates 4 and 5. To each of the 3½″ × 1½″ Flat Plates is bolted a 3½″ Angle Girder, one of which is seen at 11, Fig. 1, and these support a 2½″ × 2½″ Flat Plate 12, Fig. 2. The construction of the jib is shown in Figs. 1 and 3 and it carries two 1″ Pulleys at its head, these being mounted freely on a 2″ Rod. The jib is pivoted on a Rod passed through the upper end holes of the Angle Girders 7. At the rear top side of the jib is a second compound Rod consisting of two 2″ Rods 28, the inner ends of which are held in a Coupling 27.

The mechanism is arranged as follows. A Rod 13 mounted as shown carries a 1″ Gear 14 and a ½″ Pinion 15, and is arranged to slide about ¼″ in its bearings. It is also fitted with a handle consisting of two Cranks bolted back to back, one of the Cranks carrying a 1″ Rod in its boss. A Spring 16 is placed on one end of the Rod as shown in Fig. 2, and is retained in place by a Collar. The purpose of the Spring is to keep the Rod normally in such a position that the ½″ Pinion engages a 57-teeth Gear 17 on a Rod that carries the winding drum and a 1″ Pulley 18. The winding drum 19 is a Sleeve Piece inside which is a Chimney Adaptor and at one end a ¾″ Flanged Wheel. Mounted on the Rod immediately behind the Pulley 18 is a Socket Coupling 20. This Rod also is slidable in its bearings and can be moved about ¼″ endways by operating a lever 21. This consists of a Threaded Pin held in a Collar on one end of a Rod, the other end of which carries a Handrail Coupling. A 1″ Rod fixed in the Handrail Coupling engages the groove of the Socket Coupling.

The jib is raised and lowered by turning the crane handle that is used to hoist

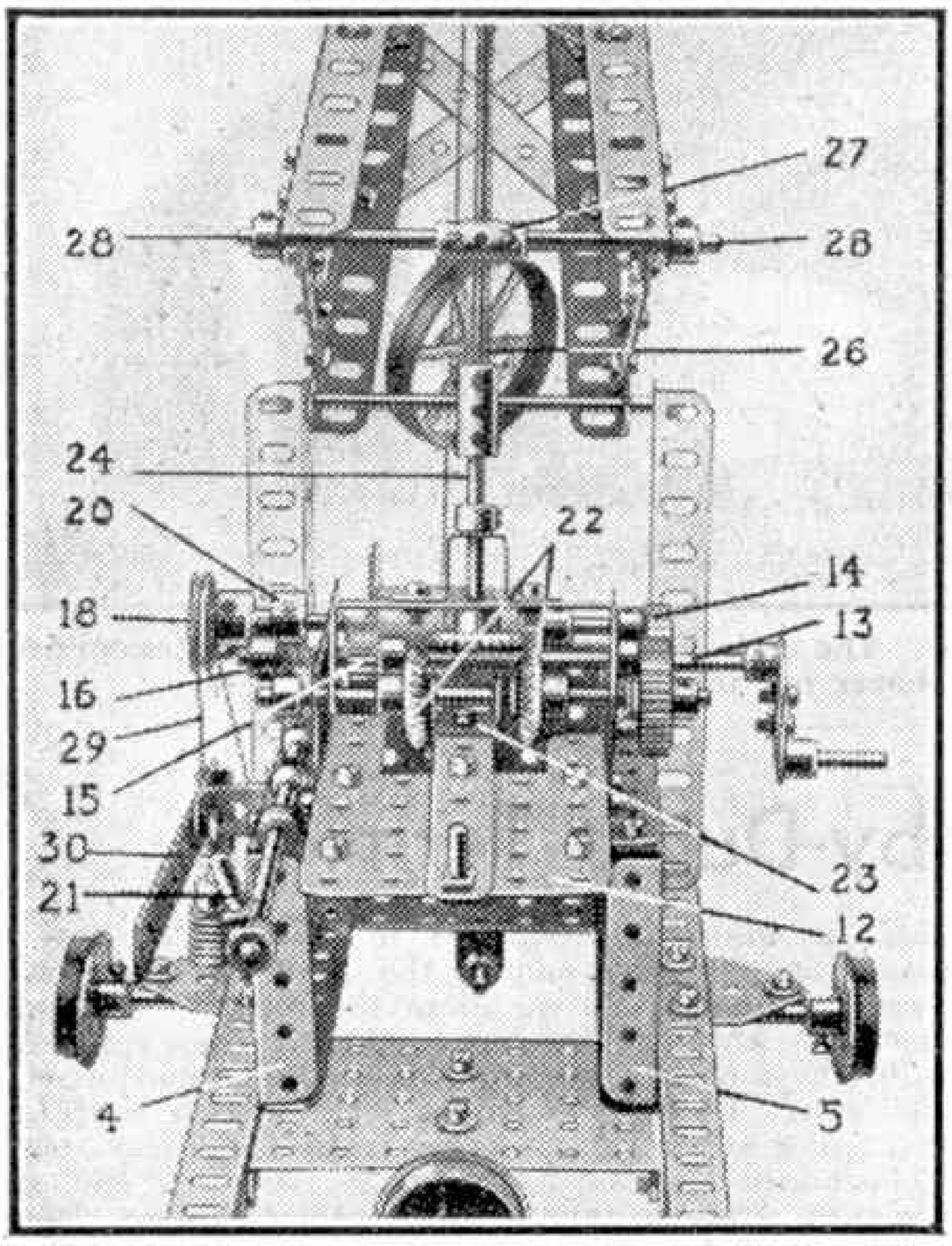


Fig. 2. The mechanism of the revolving crane.

and lower the load, but for this purpose a different train of gears is brought into use. A second 1″ Gear mounted on the rear Rod of the gear-box is engaged with the 1″ Gear 14 on the handle shaft. Also mounted on this Rod are a 2½″ × 1″ Double Angle Strip and two ⅞″ Bevels 22 with a Double Bracket 23 between them. The Rod is free to slide endways about ¼″ and is retained in its bearings by Collars. The Bevels are fixed to their Rod about 1″ apart so that by sliding the Rod either of them can be brought into mesh with a third similar Bevel fixed on the lower end of a short Rod 24. This Rod is journalled in a Double Bent Strip 25 and the 2½″ × 1″ Double Angle Strip. At the upper end of Rod 24 is a Coupling, which grips in its longitudinal bore a Threaded Rod 26 that is screwed into the centre tapped hole of the Coupling 27 mounted at the rear end of the jib.

To prevent the load falling when the hoisting gears are disengaged while luffing the jib, a band brake is fitted to the shaft of the winding drum. This consists of a Cord 29, Fig. 2, which is tied at one end to the framework of the model and then passed around the Pulley 18. The other end of the Cord is then tied to a pivoted and weighted lever 30 mounted on the side of the superstructure.

The hoisting cord is tied to the winding barrel, then passed over one of the Pulleys at the jib head and around the pulley of a single sheave Pulley Block. Then it is taken up and over the second 1″ Pulley at the jib head and finally is tied to the lug of the Pulley Block.

If a Clockwork or Electric Motor is available it may be fitted to drive the model and if this is possible its operation will be even greater fun. When a Motor is used a simple lever arrangement must be fitted to slide the Rod 13 endways in its bearings so that the different motions can be obtained. An arrangement similar to that used for sliding the rear Rod of the gear-box is suitable.

Parts required to build model Revolving Crane: 5 of No. 2; 9 of No. 3; 2 of No. 4; 2 of No. 5; 2 of No. 6a; 6 of No. 8; 2 of No. 9; 4 of No. 9c; 2 of No. 11; 2 of No. 12; 2 of No. 15; 2 of No. 15a; 1 of No. 15b; 2 of No. 16b; 6 of No. 17; 3 of No. 18b; 4 of No. 20; 1 of No. 20b; 2 of No. 22; 1 of No. 22a; 1 of No. 26; 1 of No. 27a; 3 of No. 30; 2 of No. 31; 1 of No. 32; 84 of No. 37; 16 of No. 38; 1 of No. 40; 1 of No. 45; 1 of No. 46; 2 of No. 48a; 2 of No. 52; 3 of No. 53; 14 of No. 59; 2 of No. 62; 2 of No. 63; 2 of No. 72; 2 of No. 73; 2 of No. 115; 1 of No. 120b; 2 of No. 136; 1 of No. 136a; 1 of No. 151; 1 of No. 163; 1 of No. 164; 1 of No. 166; 1 of No. 171.

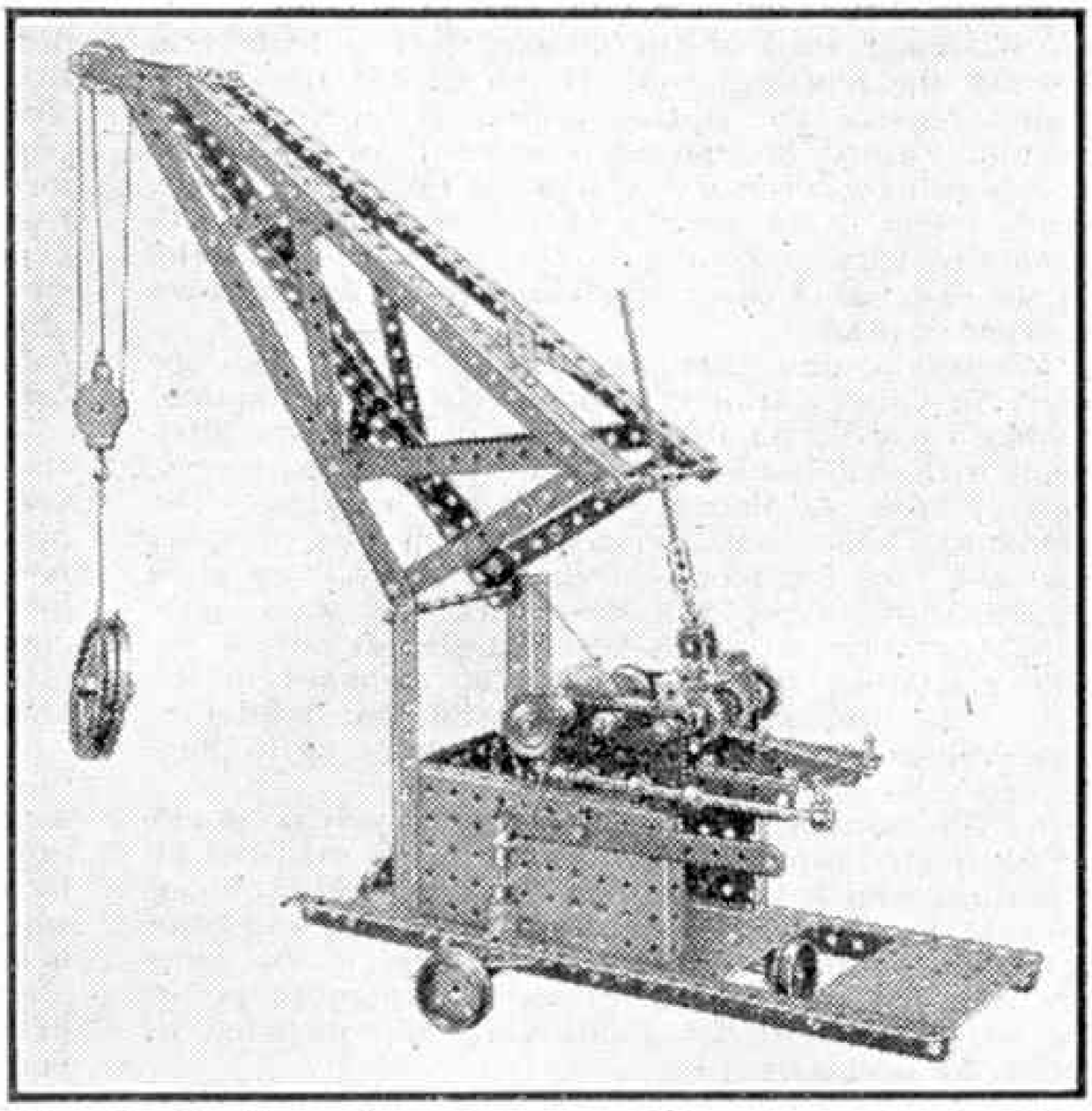
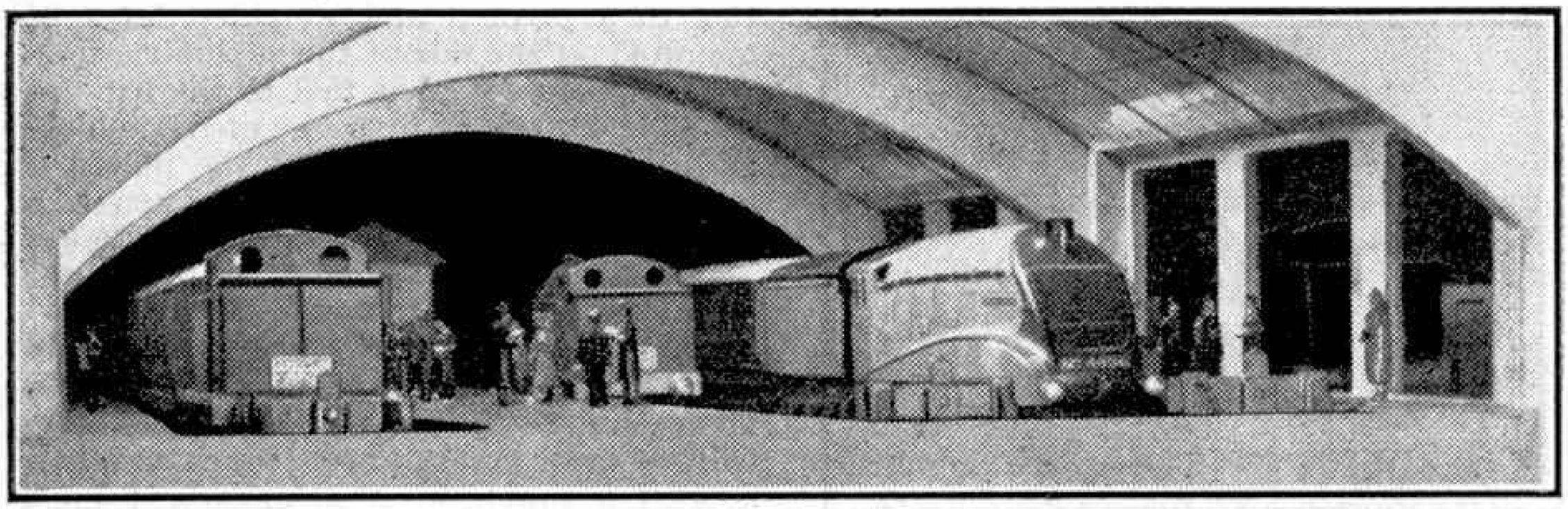


Fig. 3. Another view of the revolving crane showing the side opposite to that seen in Fig. 1.



A scene at a Dublo terminus showing operations in progress. The main line train headed by a 4-6-2 streamliner has just arrived, while a Tank engine moves out on the adjacent track.

Operations at a Hornby-Dublo Terminus

IN last month's "*M.M.*" we dealt generally with station working in Hornby-Dublo, concluding with one or two points connected with terminal station operations. We are now following up these suggestions and the notes on this page deal particularly with the working of a typical Hornby-Dublo terminus.

The illustration above shows an interior view of a terminus made up from components of the City Station type. These have been assembled to form a three-road station, while there is in addition another track outside as shown by the presence of the tank locomotive that is visible through the openings in the far wall. There are two tracks together between the far side platform and the central island platform, and there is still sufficient room left between the other face of the island and the near side platform to accommodate a single track. These arrangements will be fairly clear from the position of the buffer stops and the various locomotives that are inside the station in the illustration.

Normally the single track referred to will be brought off the inner road of the double track a little way beyond the platform end. If the double track continues outside the station limits, a crossover connection formed in the usual way by two standard points will be necessary to connect the up and down roads. The exact details of the track layout will naturally vary according to the space and material at the disposal of the individual operator and his own particular ideas.

We will assume that our working begins with the early arrival of a train of vans in charge of a standard Dublo Tank Locomotive. Such van trains are often dealt with at terminal stations for perishables, parcels and other items that require urgent handling. The standard Dublo vans are ideal for this sort of work; and the tank locomotive, which makes a very good mixed traffic type, will deal with the train quite capably. Such a train is best handled at one of the side platforms, as openings can be arranged in the side walls and will make it possible for miniature road vehicles such as Dinky Toys to back up to these in order to deal with the "load."

As the transfer of this urgent traffic will no doubt be completed rapidly, the vans can be shunted out by the same engine that brought them in, and they can be held as a complete formation for an outgoing train later in the operations. Alternatively, if the vans are required for general service elsewhere they can be worked out to the goods yard and included in trains as necessary.

The terminal operations connected with suburban trains are usually a little different from those carried out with main line trains. With suburban arrivals all is hustle and bustle; as a rule there is not the space in miniature terminals to allow of crossover points at the inner end of the track for "running round" purposes. So we adopt the turnover method of engine working that has frequently been referred to in these pages. The arriving engine is uncoupled, and moves forward to an insulated section next to the buffer stops. The section is then switched out while another engine backs on to the other end of the train ready to take it away. After this has gone the released engine moves out to the engine siding and waits for its next turn of duty. Or it may, if traffic is brisk, cross over and back on to another train already at the platform. These operations repeated several times with a different train, or even with the same train at short intervals, can be very fascinating.

Main line traffic is handled with rather more deliberation. Often the engines of long distance trains back their stock out to the sidings where the vehicles are made ready for their next trip. Then the engine goes about its own business of a similar nature. Main line trains for departure may be run down to the terminus by a tank engine, which has to wait at the buffer stops until the train leaves. This duty can in fact be quite conveniently the first trip in any fresh turn of tank engine working and forms a convenient means of moving the engine from the shed to the station. In due course the 4–6–2 express locomotive will back on to the other end of the train—always a thrilling moment for the platform observer—and very soon the train will depart. This will leave the temporary "carriage pilot" free to carry on with its next spell of suburban working.

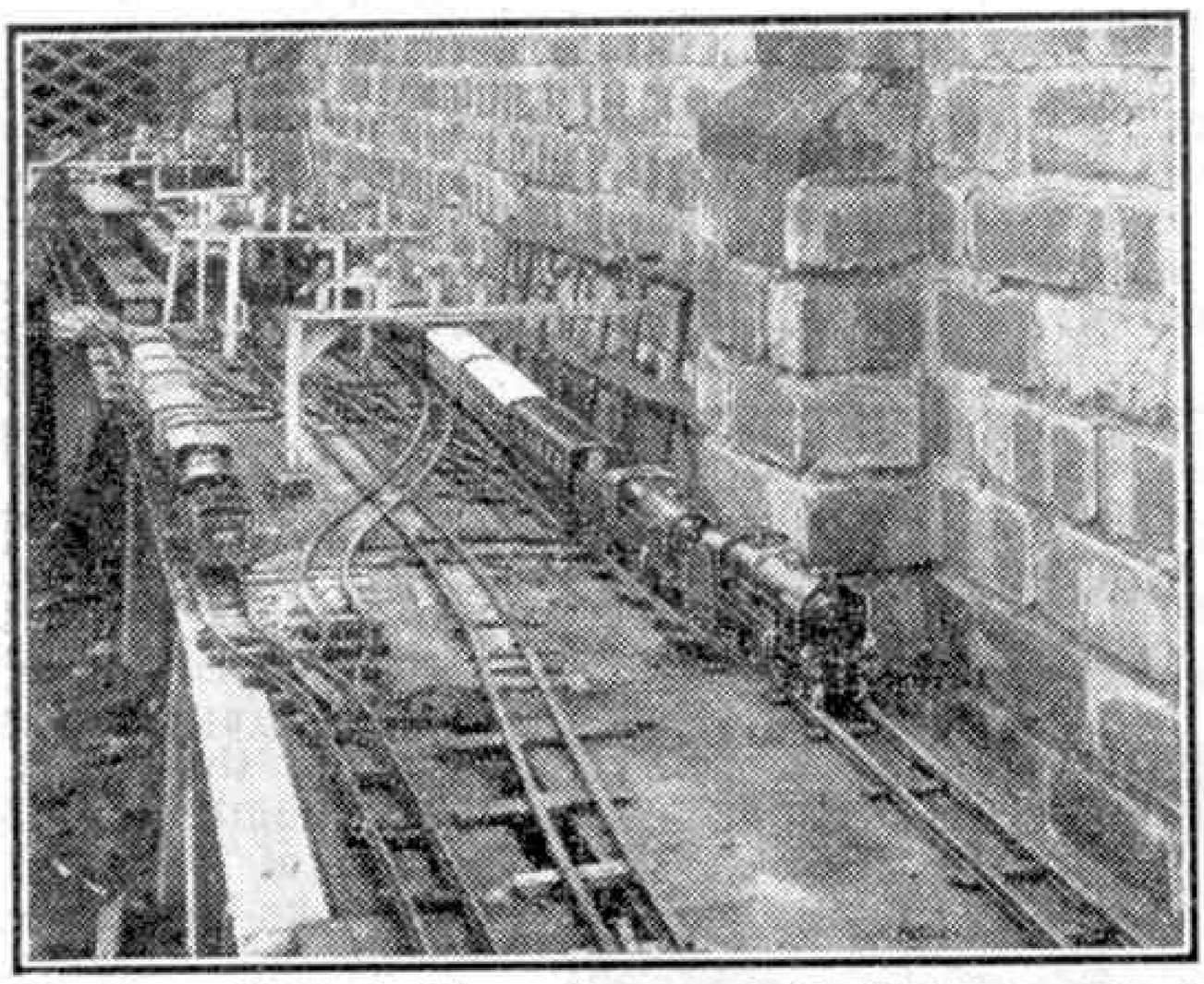
These are just a few typical operations concerning the various kinds of traffic. Naturally there will be variations, otherwise the operations might tend to become boring instead of enjoyable. A van—a horse-box perhaps—that has arrived in the formation of a local train may have to be transferred to an outgoing express and this may involve some quite intricate movements not only of engines and rolling stock but also of points, signals and section switches.

Again, a main line train may arrive that consists of two sections, the main one being the two-coach Articulated Unit destined for "our" station, the other being perhaps a single Corridor Coach. The latter is to be worked separately out to its destination, supposedly another town a little way away that is not served directly by the main line. Therefore, soon after the 4–6–2 streamliner has come to rest by the buffer stops an 0–6–2 tank takes charge of the rear portion. Couplings are parted between the two sections of the train, and the "through coach" sets out on the last lap of its journey. Similar operations in reverse, representing a through working in the opposite direction may be called for at times.

Developments on a Hornby Railway

L.M.S. Express Services in Miniature

THE illustrations on this page show some of the more recent developments on the remarkable miniature railway that is operated by Mr. J. Southwell, Northampton, and his family. Continuous expansion has been the rule, with the result that the system now includes not only the main line of the L.M.S. from Euston to Holyhead, but also offshoots representing the Central and South Wales sections on the one hand; and on the other, Heysham, Liverpool and Manchester are other terminal points served. There are in addition various intermediate stations and these all add to the interest and realism of working.



The down "Irish Mail" on the remarkable L.M.S. Layout of Mr. J. Southwell, Northampton, the latest developments on which are referred to on this page.

The railway is an outdoor one operated almost continuously from April to November. The track is raised up to a convenient height for operating on a timber structure, which is kept well creosoted. The stations and other surroundings at Euston and Holyhead are housed in sheds, while that representing Cardiff is accommodated in a garage. This undercover feature has made it possible to provide a certain amount of detail, particularly at Holyhead, where the harbour station is complete with models of the familiar mail packets of the L.M.S.

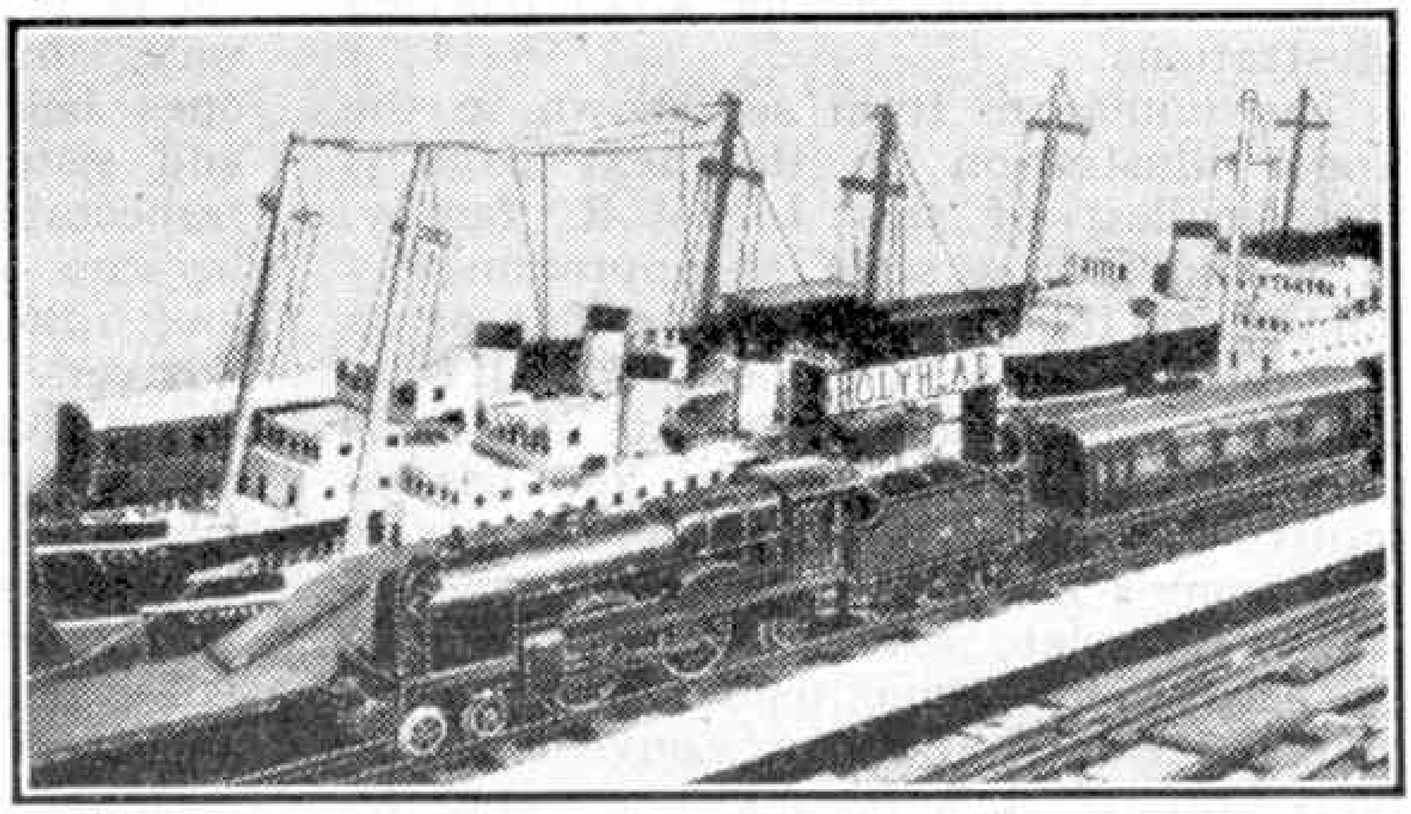
Owing to the shortage of miniature railway material during the past few years, track extensions have had to be carried out partly by using home-made wooden rails. Some of these simple, but quite serviceable "metals" can be seen in the centre track in the upper illustration. They appear to stand the weather quite well, being creosoted along with the baseboard structure at intervals.

Until some years ago running arrangements for the operating season were prepared during the winter time and were based on workings carried out during the previous "session." Now, however, a complete three-year plan is in course of being run off and it is anticipated that this will be completed by November this year. As the running programme consists of a series of "episodes," each self-contained with varied individual details, some idea can be gained of the care involved in its preparation. Both summer and winter timetables are prepared and worked through systematically, and naturally the operating details and train loading vary between the two sets of services. Duplications for holiday traffic and other variations are introduced so that engines, rolling stock and operators have a really busy time.

Hornby Clockwork locomotives are used almost exclusively to provide motive power, and Hornby rolling stock is used to make up the trains. A very strong feature is made of the provision of name and destination boards for the vehicles so that the different sections of through trains are readily identified. This gives a very realistic effect and not only helps the "passengers," but also aids considerably the busy traffic operators. Even the local trains carry small detachable destination boards, as is usual in actual practice.

Until recently the principal trains handled have been those involved in the "*Irish Mail*" and other services between Euston and Holyhead. In connection with these a small fleet of ships bearing the characteristics of the real L.M.S. ships of the narrow seas has been brought into being, and the lower illustration shows a busy spell at Holyhead. The miniature R.M.S. "*Cambria*," the nearest vessel to the train in the foreground, is supposed to have just arrived and the train represents the up "*Irish Mail*" waiting to depart for Euston.

With the development of the railway, however, more ambitious services can be provided so that now in addition to the "*Irish Mail*" the "*Lancastrian*" and "*Mancunian*" are worked in both up and down directions between Liverpool and Manchester respectively and London. Then, on summer schedules only, there is "*The Welshman*" serving Caernarvon, Holyhead and London, and several other services.

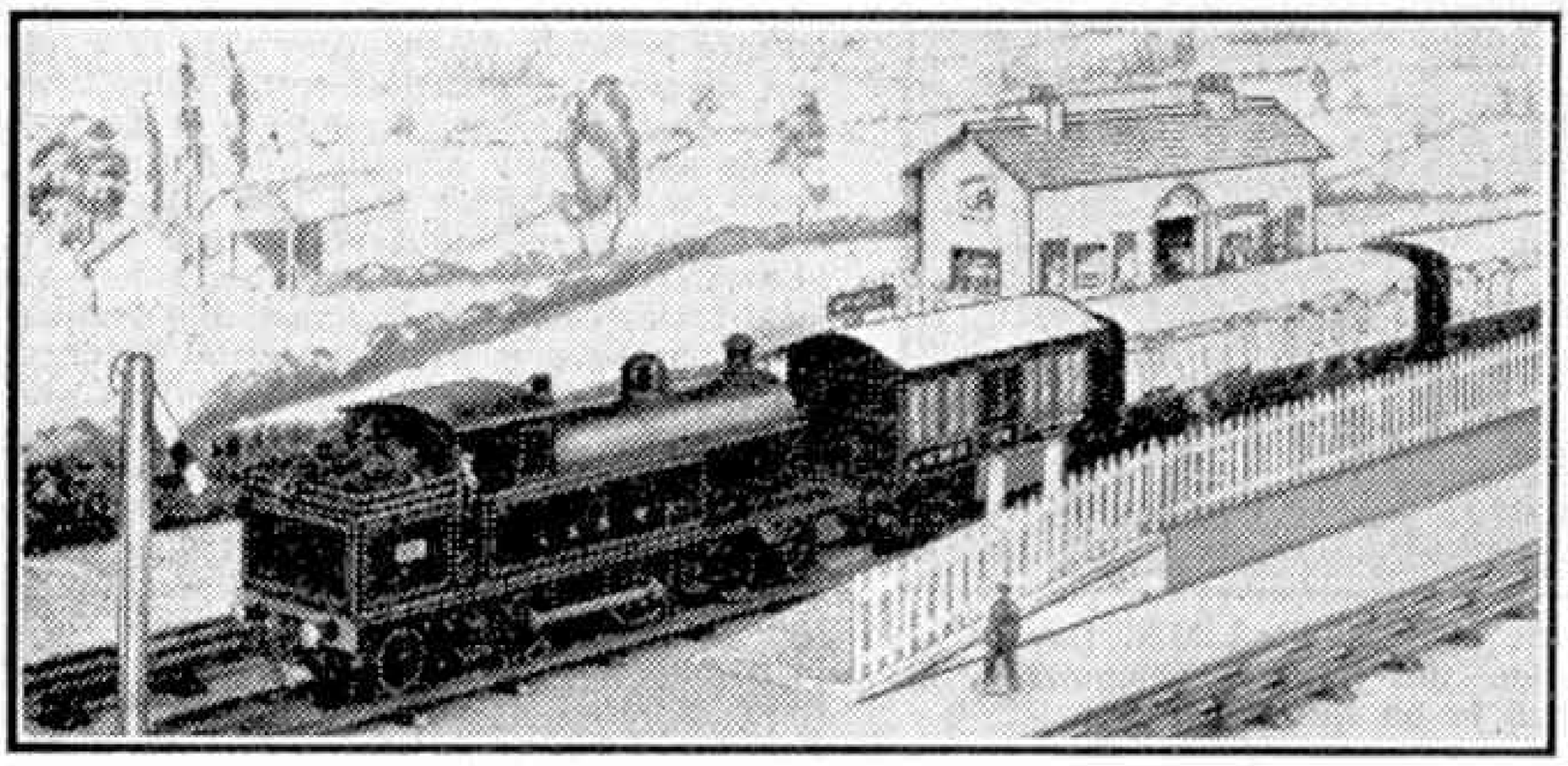


Holyhead Station and Harbour showing the up "Irish Mail" ready for departure. Note the realistic steamers at their berths.

L.N.W.R. Models of Bygone Days

By "North Western"

THE centenary of the former London and North Western Railway has reminded me of the models of North Western engines that were so popular when this company was at the height of its fame. It is probably correct to say that more models of North Western locomotives, carriages and wagons were turned out than those of any other company, especially when the great number of scales and gauges formerly in use is remembered. At one time one could have obtained a miniature L.N.W.R. 4-4-0 "*Precursor*" in almost all known scales from Gauge 0, the smallest then in use, to 1½ in. scale with a gauge of 7¼ in. and big enough to ride on. Before the days of Hornby Trains, the bulk of smaller scale miniature railway equipment was partly or wholly made on the Continent. Various L.N.W.R. models, in different scales, are shown in the accompanying illustrations.



"Next Stop Willesden"! A veteran L.N.W.R. "Precursor" Tank model, travelling on Hornby Steel Track, leaving the Hornby "Wembley" Station.

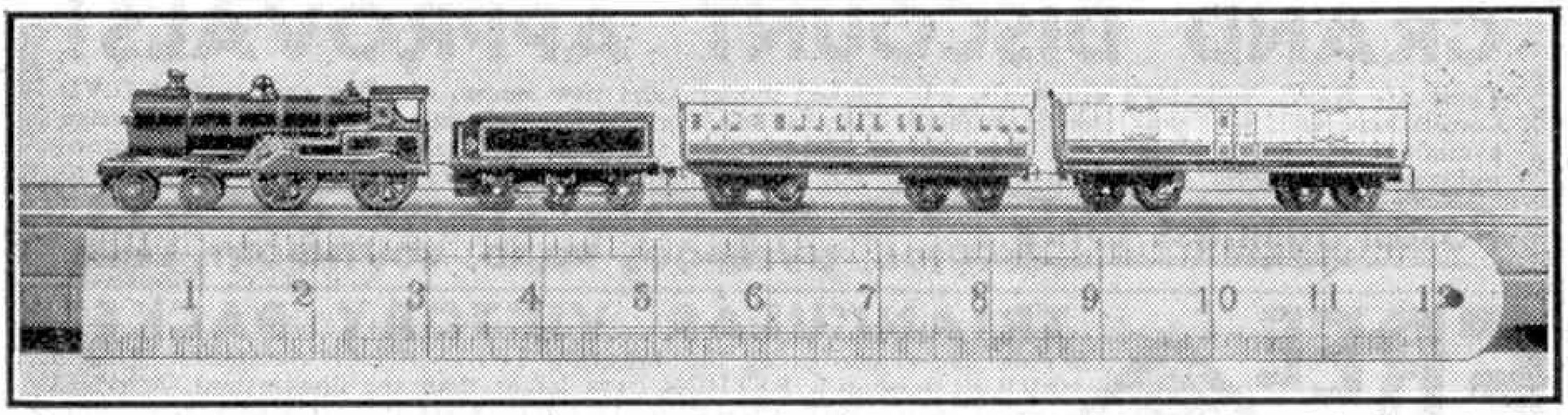
The miniature train set shown in the upper illustration on the next page is the smallest of this L.N.W.R. family. It is built to a scale of approximately 2.5mm. to the foot, and some idea of its size, or lack of it, can be gathered from the foot rule placed alongside it. It is purely a "table top" model and has no motive power except that provided by the owner's hand.

The complete set as bought in 1914 consisted of an engine, tender, two coaches and brake van, but for convenience in photography, and to make possible an exact comparison with the foot rule shown in the illustration, one coach has been omitted from the picture. The whole of the bodywork is carried out by tinprinting in quite convincing style, the characteristics of Crewe and Wolverton stock of the time being successfully reproduced considering the small size of the models. The make-up of the train of non-corridor stock is representative of many L.N.W.R. secondary expresses, and the general details of the coaches are similar to those of corresponding tinprinted vehicles then also available in larger scales.

The engine was originally a curious "cross-breed" between the two principal classes of L.N.W.R. 4-4-0s. Thus while named "*George the Fifth*," and having the straight splashers fitted to that class, it was numbered 513 instead of 2663; and the smoke-box, bogie wheels and curved nameplate suggested the "Precursor" class. So in due course the owner extended the smoke-box to more correct proportions to represent a "George," this class being then in the hey-day of their exploits.

Another modification was to reduce the depth of the guard irons in front of the leading wheels. These were found to have a marked tendency to dig into the table cloth that formed the "permanent way," over which this train and similar ones belonging to the owner's brothers and sisters must have covered quite a respectable mileage. These little trains became a family institution, but extra long runs were apt to make some of the "drivers" giddy owing to the number of times that they had to circle round and round the table. All the stock had fixed wheelbases, but the couplings enabled the trains to curve satisfactorily so long as the turn was not too sharp.

Turning now to the smallest scale then in use for trains that ran on rails, Gauge 0 —Gauge 00 was unknown until 1921—, the engine in the illustration on this page demands attention. This is a



A "table top" train of years ago, representing an L.N.W.R. "George the Fifth" locomotive and bogie stock. The foot rule beneath the train gives some idea of its diminutive size.

veteran which dates back to about 1909 and represents an L.N.W.R. "Precursor" Tank, a class long familiar in and out of Platforms 4 and 5 at Euston, especially in the days before the Watford electrics. The model is a tough specimen and still wears its original livery, including the well-known initials *"L.&N.W.R."* on the side tanks.

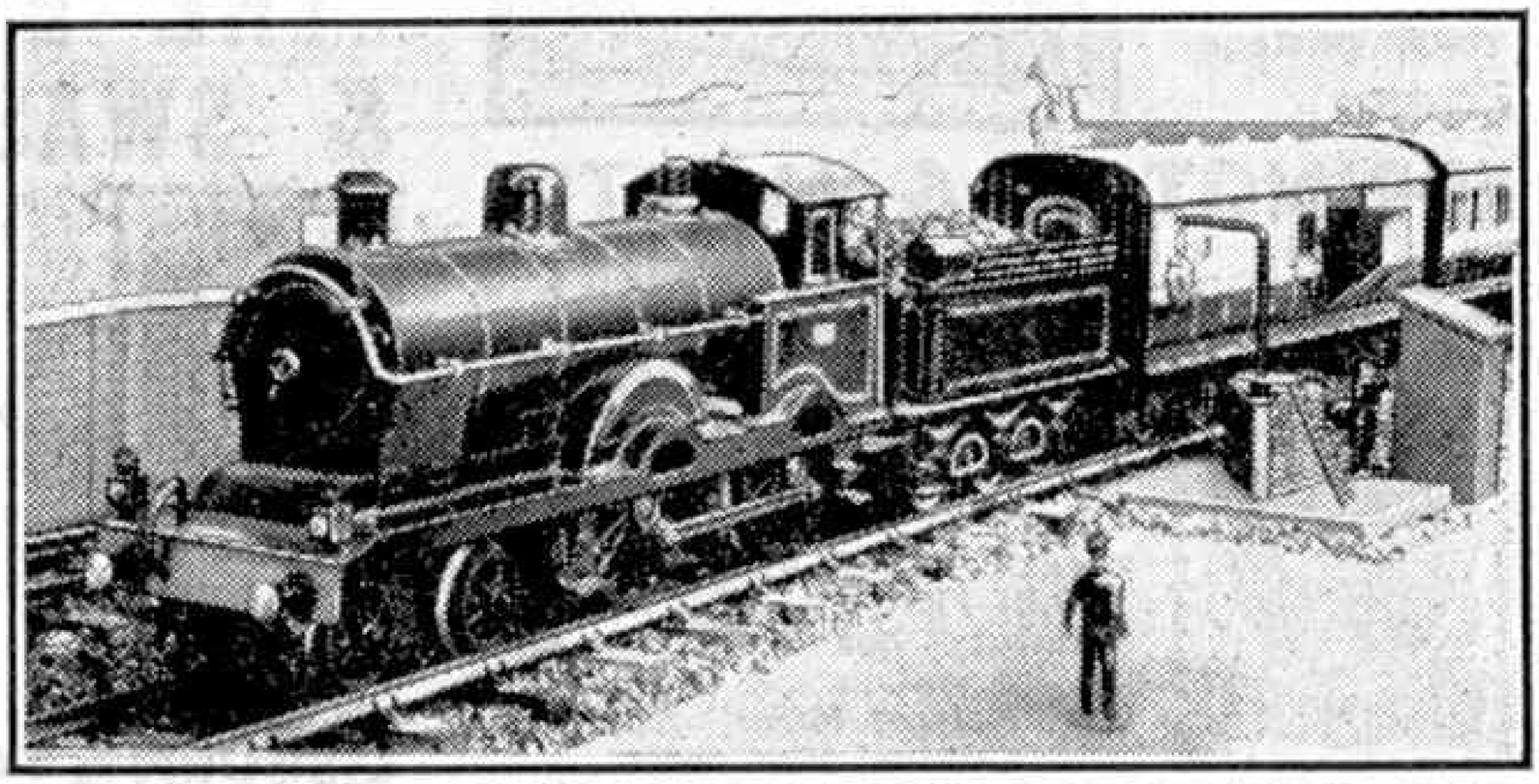
The original clockwork, which was reversed from the cab by means of a "lift up or press down" lever projecting through the backplate into the bunker, ceased work a long time ago. A considerable amount of searching was necessary before another was discovered, in which the relative position of the wheels and the winding shaft was just right. It was particularly desired not to spoil the original finish on the tank side by having to provide a new key hole which might blot out any of the lettering. Eventually everything worked out satisfactorily, with just the slightest vertical enlargement of the round key hole to an oval shape, leaving the lettering intact.

The train shown represents an up "Watford local" with, as always, the engine bunker first. It is posed on Hornby Steel Electric track, with a Hornby No. 4 "Wembley" station. The vehicle next to the engine is a typical L.N.W.R. milk van with tinprinted bodywork showing the characteristic louvred sides and bold lettering. The coaches finished by means of printed papers once available in L.N.W.R. colours, successfully represent the rather slim and low-roofed "Watford Sets" of earlier days. They were put together at home.

At one time the next size upward, Gauge 1 with a scale of $\frac{3}{8}$ in. to the ft., was probably the most popular for model railways, and a greater selection of material was available in this scale than in any other. There are still such railways in existence, notably that of Mr. V. B. Harrison that was described some years ago in the *"M.M.,"* but in general Gauge 0 occupies the place once held by the larger size. The lower illustration on this page is therefore of special interest as the items shown are all Gauge 1 components of bygone days. The train represents the *"Irish Mail"* of about 40 years ago travelling on the North West Coast section of the L.N.W.R. The engine displays the white headboard that appears to have been carried at one time by the "Mail" engines along the Coast route.

This locomotive is one of the numerous versions of the 4-4-0 "Precursor" class mentioned earlier; and, unusually for a commercial model, it does not represent the first engine, but another of the series, No. 310 *"Achilles."* This old warrior dates back to about 1911, and as in the tank model previously described the original clockwork mechanism has been replaced.

Although the engine (*Continued on page 348*)



The "Irish Mail" in L.N.W.R. days reproduced in Gauge 1. The train is travelling along a miniature "Coast section."

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For other Stamp Advertisements see also pages 344 and vii.

Stamp Collecting

New Zealand's Peace Issue

By F. Riley, B.Sc.

LAST month I dealt generally with New Zealand's stamp story down to the appearance in 1940 of the centennial issue. No further issues were made during wartime, with the exception of those of an annual series begun in 1929 that has aroused the widest interest throughout the world. This is the succession of "Health" issues, as they are usually called. The origin of these can be traced back to the Christmas seals of Denmark and other countries, an article on which appeared in the "*M.M.*" for December 1944. A suggestion that New Zealand should produce Christmas seals led to a decision to issue stamps with a special additional charge in order to raise money for charity, and eventually it was decided that the proceeds should be devoted to the Children's Health Camp movement started in 1919 by Dr. Elizabeth Gunn, a School Medical Officer.

The design of the first New Zealand "Health" stamp showed a nurse in uniform, and the slogan "*Help Stamp Out Tuberculosis.*" The value was 1d., with a surcharge of 1d., and the same design was issued in the following year, with the inscription changed to "*Help Promote Health.*" Year by year other stamps of the same kind appeared with interesting designs of various types. Some of them have been very attractive, especially those showing children playing, and their popularity has been very great indeed. In recent years the Royal Princesses have provided the subjects of design. Triangular stamps portraying Princess Elizabeth and Princess Margaret Rose on the 2d.+1d. and 1d.+½d. values respectively appeared in 1943, and in the following year both stamps had the same design, with portraits of the two Princesses on it. More than 3,000,000 stamps of each value were sold in each of these years. The most recent issue is the Peter Pan one illustrated in the "*M.M.*" for December of last year.

Now New Zealand has made a further splendid contribution to the commemorative stamps of the world by a magnificent peace issue. The end of the war of 1914–18 was marked by the appearance in January 1920 of a set of eight stamps to commemorate the event, the features of the designs ranging from the head of a Maori, flanked by New Zealand fern leaves, to one of Landseer's lions from the base of the Nelson Column in Trafalgar Square, London. The issue commemorating the end of the second world war is a great advance on this. Altogether there are 11 stamps in the series, from ½d. to 1/–, and each has been

planned to possess a special significance, while together they tell a story of patient endurance and sacrifice during the long fight for freedom, truth and justice.

The ½d. stamp shows Lake Matheson and the Southern Alps, including Mount Cook and part of the Fox Glacier. This stamp was illustrated in the "*M.M.*" for June of this year. It is deep green and brown-purple in colour, and the typical New Zealand scene of tranquillity shown on it symbolises the return to peace. Faith in Constitutional Government is the idea behind the design of the 1d. stamp, in bright green, which shows the Parliament House in Wellington, the capital of New Zealand. The purpose of the 1½d. stamp, in signal red, is to pay a tribute to the people of Britain for their courage and faith during the dark days of 1941; on it London, the heart of the Empire, is symbolised by a representation of St. Paul's Cathedral enclosed in a "V," and in the upper corners are the four stars of the Southern Cross to indicate the bond with New Zealand. The 2d. stamp, in royal purple, portrays the King and Queen with the two Princesses.

The next four stamps in the issue, the grey-green 3d., the bronze green and orange 4d., the green and deep ultramarine 5d. and the chocolate and vermilion 6d. values, are tributes to the New Zealand Forces engaged in the great struggle. The first shows on one side a "Lancaster" and a "Spitfire" and on the other an "Empire" flying boat and a "York" transport aeroplane, with the badge of the Royal New Zealand Air Force in the centre. The second pays tribute to the Army. The overseas badge of the New Zealand Army personnel forms its centre,

with a "Valentine" tank and soldiers marching in front of a pyramid on the left, and a farm scene with a tractor ploughing on the right. Next comes the Navy and Mercantile Marine stamp, with the Royal New Zealand Navy badge flanked by the destroyer "*Achilles*" and the motor vessel "*Dominion Monarch*," and finally there is a tribute to workers on the home front, in a design with the New Zealand coat-of-arms and industrial and farming scenes.

Of the three highest values in the series, the

Of the three highest values in the series, the 8d. stamp is a tribute to youth. This is a reproduction in black and crimson of the stained glass window of the Memorial Hall of Wellington Boys' College, showing a knight holding a banner with the cross of St. George. This design pays honour to the devotion of youth to the nation's cause. A spirit of thankfulness is the theme of the 9d. value, a beautiful stamp in pale ultramarine and black showing the Franz Josef Glacier as seen from the restful interior of the church at Waiho Gorge. The final stamp, the 1/– value, is one of remembrance and shows the National Memorial Campanile at Wellington.

PEACE STAMP FREE

To commemorate the Peace the **NEW ZEALAND** Government have issued this very attractive stamp depicting **The Royal Family.** It is printed in Royal Purple colour and besides showing the family group of our King and Queen and both the Royal Princesses, is in addition inscribed: **"In peace, long may they reign."**

We have managed to obtain a supply of these stamps and therefore have pleasure in offering **YOU** one **ABSOLUTELY FREE** for your collection. To get it you must write and ask us for Royal Family Stamp Free and an Approval Selection and just send us 3d. in stamps for our posting expenses. It is a stamp you will love to receive and will be envied by your friends.

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For other Stamp Advertisements see also pages 342 and vii.

Stamp Gossip

and Notes on New Issues

By F. E. Metcalfe

WHEN readers saw the "Victory" stamps they must have been somewhat amused by newspaper comments, inspired by official handouts, regarding the great feat of preparing two postage stamps, when they know that Continental countries are able to turn out a new set nearly every week. Moreover the stamps turned out generally in Europe do those countries credit, and are not uninspired doodles such as we have been served with. It really is amazing what a fuss we make about producing a new stamp or two, and it is equally amazing what a poor result we always get after all the to-do.

All stamp-producing countries have had special issues, and our own country has produced for others some really magnificent stamps. Yet those issued by our own Post Office are by far the dullest in the whole world. If any reader should think this is an exaggeration just let him open his catalogue, and in the G.B. section try to find a single special stamp that doesn't give him a metaphorical pain in the neck. Well, we were the first country to produce postage stamps, and apparently we are going to be the last to produce any worth looking at. I know that many claim that our "penny black" is the most beautiful stamp ever, but this particular stamp wasn't even a good one, for the design was so overloaded with black ink that postmasters of that day were at their wit's end to find another ink that would show that the stamp had been used.

To get back to "Victory" stamps, our two British have been overprinted "Tangier" for use in that port and we are illustrating one of these. We are also illustrating one of the four Burma "Victory" stamps mentioned last month. The designs of these would not have looked too bad if they had been line engraved, or if the photogravure process of printing had been employed.

The 1d., 2d., 6d. and 8d. values of the New Zealand Peace set have been overprinted for use in Cook Is., Niue and Western Samoa. We are illustrating one of these. As the sets are within reach of most collectors they are selling freely, as is of course the New Zealand set itself. So beautiful indeed is this New Zealand set that it will probably always be a seller.

We are illustrating the latest United States commemorative, a stamp issued to mark the 150th anniversary of the State of Tennessee. The U.S.A. postal authorities are to be congratulated on the way they cater for the public's needs, but all these commemoratives do look a bit monotonous in their various puce shades. The practice of using certain colours for certain values, as members of the Postal Union agreed to dolongago, has long since ceased to have any meaning, so it is a wonder that the U. S. A. doesn't go in for a few colour changes for its special commemorative stamps.

After having empty shelves for a year or two, dealers are now able to show their eager customers a few stamp albums, and a tip about these might not be out of place. The first thing that nine out of ten collectors say when they look at an album which they fancy is: "*Have you any extra leaves for this?*" They are obviously deceived by the thinness of the book and think that it will comfortably hold a few more pages. Well, it just won't. Manufacturers know how many leaves the binders will hold without too great a strain on the springs, and if more leaves are added, the album, as stamps are stuck in, will bulge to such an extent that the springs will give out long before they would have done if the extra pages had not been inserted. So instead of the collector gaining, he loses by his false economy. Moral: don't add leaves to the album you buy. It will be quite thick enough when you have inserted your stamps.

We seem to have talked a lot about "Victory" stamps, but as they are all the rage and will probably continue so for some time, we may be excused for making one of the sets our monthly tip for a good buy. As collectors know, the South Africa and overprinted sets had only a very short life, so much so that they were out of issue before some dealers got all they wanted. This particularly applied to the set overprinted for Bechuanaland, and it is impossible already for dealers to buy any quantity wholesale of this set. Collectors can however get an odd set or so for something under half a crown. Well, see to it that you get your set before you have to pay twice as much, as you undoubtedly will later on.

No doubt collectors were thrilled by the news of the great find of a part sheet of "twopenny blues" in a Scottish palace. The extraordinary thing about it all is the fact that the case which held the stamps was apparently lying about and had not been opened for a century. Perhaps more extraordinary still is the fact that such is the demand for postage stamps that a few that once cost 8/- have now been sold for the sum of 6,000 guineas. The name of the buyer of this remarkable find has been kept secret.

These finds are real romances, but one of the most interesting took place a few years ago. An old trunk was opened in a Mayfair attic and a number of envelopes found in it contained stamps just as they had been received many years before from certain colonial postmasters. Apparently a young collector had sent money for stamps to the colonies and then had forgotten them. They realised over £30,000 at auction.

From Our Readers

This page is reserved for articles from our readers. Contributions not exceeding 500 words in length are invited on any subject of which the writer has special knowledge or experience. These should be written neatly on one side of the paper only, and should be accompanied if possible by original photographs for use as illustrations. Articles published will be paid for. Statements in articles submitted are accepted as being sent in good faith, but the Editor takes no responsibility for their accuracy.

A PRIVATE ZOO

I often visit Royal King, a friend of mine who lives near, a man with a wide reputation as a rat catcher who has twice broadcast in countryside programmes. He is known as the King of Ratcatchers. I never go to his place without my camera, for I know there will be something to see, and the accompanying illustrations were obtained on a recent visit.

After our greetings were over Royal turned and led me towards a cabin. As he opened the door I knew that he had something for me and my first picture, which shows two kestrels perched on his fingers. He had taken these when young a short time before, and they are being reared in captivity. Otherwise the birds would not have perched voluntarily on a man's fingers.

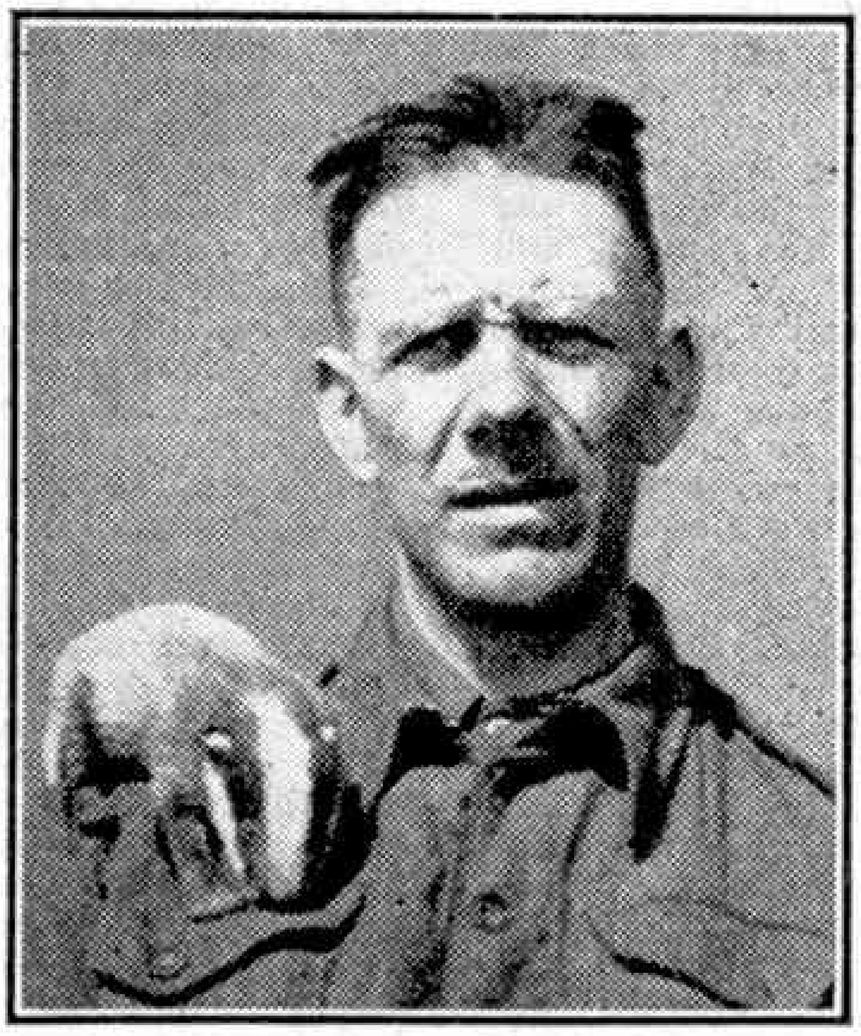
Now there had been some considerable damage done on the fells close by and both poultry and lambs had been missing. At last suspicion fell on foxes, and Royal was called in to help. A hunt was organised, and the vixen responsible was despatched. Three of her cubs were taken alive. Royal brought them home and placed them in a pen along with two pups, where I saw them all eagerly awaiting mealtime. Pups and fox cubs sleep and play together the whole day long, and they are allowed to run free in an open space close by the house. If they stray too far away they return at the call of "*Foxie*."

Royal King with two kestrels that he had captured when young and reared in captivity. The photographs on this page are by R. Wrigley, Clitheroe.

Finding food for the cubs is a bit of a problem. I think that perhaps some day, when they are at play, they will feel an urge to see what lies beyond that hedge around the croft, and will be off to explore the outer world for themselves.

As I was making ready to leave I was introduced to the latest arrival, a four-week old badger cub "*David*." Royal has previously taken badgers alive and kept them for a time, but so far as he knows a badger has never before been bred in captivity. He has high hopes of rearing and taming this latest pet, shown on his shoulder in the second of my photographs.

R. Wrigley (Clitheroe).



"David," a young badger born in captivity that is now being reared by Royal King.

DROUGHT

Although South Africa escaped the terrors of the second world war the country has had to endure a terrible drought, when such cities as Johannesburg sweltered in the heat, and the air around one seemed to be heavy and to have a foul smell. Even the trees drooped. In the countryside the cattle could be heard bellowing as they walked about looking for a tiny pool of water that was not stagnant so that the calves at least could drink. But the water was not there. Rivers that once flowed along merrily to the tune of the breeze in the willows had dried up, and the willows were shrivelled up with the heat and for want of rain. The dongas were baked by the scorching sun, and where shrubs and wild flowers once flourished there were only little bushes of dry stick.

In the Cape Province animals were taken by truck to other parts where there was a little more grazing, and donkeys were sold for as little as 1/6 in some areas. The plight of the wild animals was desperate, as human aid could not be given them, and in one area the springboks, South Africa's national emblem, were so weak that they could be caught without any difficulty. The natives too suffered greatly on account of the drought, and the Government had to subsidise their food. For water boreholes had to be used, and in some areas these had to be driven as deep as 2,000 ft. below the surface before water was found. Drought brings many evils in its train and how far its effects may extend can be realised when we reflect that the lack of plentiful supplies of clear, fresh water for cows may affect the milk they yield. The result of this may be epidemics of various diseases, particularly those to which young children are liable.

The drought emphasised the need for the construction in the near future of more irrigation dams, canals and waterways to conserve water supplies for use in times of drought.

Elizabeth Sykes
(Malvern, Johannesburg).

Competitions! Open To All Readers

A Ten-Point "Railway Quiz"

"Quiz" Competitions are always popular, and here we give readers a further chance of using their railway knowledge with the opportunity of winning a prize. There are ten questions to answer. Here they are:

1. What is a slip carriage?
2. The L.N.E.R. main line in the illustration on this page runs parallel to the electrified tracks of another company for some distance. Where is this and what is the other company?
3. What is a "Caboose"?
4. What is meant by the interlocking of signals and points?
5. What is a Retarder? Which railway first used this appliance in Great Britain, and where?
6. When did "*The Royal Scot*" first carry this title?
7. Which British railway has described itself as "The Best Way"?
8. Name the terminal points served by "*The Devonian.*"
9. Which is the longest railway tunnel in the world?
10. Which company holds the British maximum speed record?

As usual there will be two sections for Home and Overseas readers respectively, and in which there will be prizes of 21/–, 15/– and 10/6 for the best entries in order of merit, with consolation prizes for other deserving efforts. Where there is a tie the judges will base their decision on neatness and originality in presentation.

Entries must be addressed "*August Railway Quiz, Meccano Magazine, Binns Road, Liverpool 13*" and must be posted to reach this office on or before 30th September. Overseas closing date 31st March, 1947.

August Photographic Contest

This month's contest is the 8th of our 1946 series, and in it, as usual, prizes are offered for the best photographs of any kind submitted. There are two conditions: 1, that the photograph must have been taken by the competitor, and 2, that on the back of the print must be stated exactly what the photograph represents. A fancy title may be added if desired.

Entries will be divided into two sections: A, for readers aged 16 and over, and B for those under 16. They should be addressed "*August Photographic Contest, Meccano Magazine, Binns Road, Liverpool 13.*" There will be separate sections for Overseas readers, and in each section prizes of 15/– and 7/6 will be awarded. Closing dates: Home Section, 31st August; Overseas Section, 28th February, 1947.

Prize-winning entries become the property of Meccano Ltd. Unsuccessful efforts will be returned if they are accompanied by a stamped addressed envelope or wrapper.

COMPETITION RESULTS
OVERSEAS

May 1945 "Photographic" Contest.—1st Prizes, Section A: N. Tasker, East Malvern, Australia; Section B: L. Norman, Malta, G.C. 2nd Prizes, Section A: D. A. Williams, Cairo, Egypt; Section B: R. Selby, Montreal, Canada. Consolation Prizes: B. Hewitt, Bombay, India.

June 1945 "Crossword" Contest.—1st Prize: P. Vella, Valletta, Malta, G.C. 2nd Prize: M. H. Alderidge, Johannesburg, S.A. 3rd Prize: G. Hebblewhite, Cape Town, S.A. Consolation Prizes: I. Boocock, Canterbury, N.Z.: K. W. Dey, Hamilton, N.Z.

June 1945 "Locomotive Pie" Contest.—1st Prize: J. T. G. Johnstone, Wellington, N.Z. 2nd Prize: R. A. G. Ogden, Victoria, Canada. 3rd Prize: L. M. Carey, Canterbury, N.Z. Consolation Prizes: A. Morgan, Montreal, Canada; A. K. Skinley, Madras, India.

July 1945 "Photographic" Contest.—1st Prizes, Section A: B. Tallow, Toronto, Canada; Section B: A. K. Lorimer, Johannesburg, S.A. 2nd Prizes, Section A: L. Harrison, Colombo, Ceylon; Section B: C. Taylor, Brussels, Belgium. Consolation Prizes: M. Power, Capetown, S.A.; N. Walsby, Delhi, India.

July 1945 "Shunting Puzzle" Contest.—1st Prize: D. R. Heeramaneck, Bombay, India. 2nd Prize: Cpl. Elvey, R.A.F., S.E.A.A.F. 3rd Prize: P. Entwistle, Pretoria, S.A. Consolation Prizes: O. Owens, Johannesburg, S.A.; P. A. Hewitt, Colombo, Ceylon.

July 1945 "Aeroplane Recognition" Contest.—1st Prize: R. L. Campbell, Montreal, Canada. 2nd Prize: G. I. Dey, Hamilton, N.Z. 3rd Prize: A. H. Yates, Port Elizabeth, S.A. Consolation Prizes: K. W. Dey Hamilton, N.Z.; A. M. Sinclair, Cairo, Egypt.

August 1945 "Photographic" Contest.—1st Prize, Section A: M. H. Stanley, Winnipeg, Canada; Section B: F. D. Arnold, Melbourne, Australia. 2nd Prize, Section A: M. Smethwick, Toronto, Canada; Section B: W. L. Wallace, Cape Town, S.A. Consolation Prize: P. J. Parkinson, Claremont, S.A.

August "Summer Doublet" Contest.—1st Prize: Mrs. M. Most, Natal, S.A. 2nd Prize: G. Van Wumnick, Maastricht, Holland. 3rd Prize: J. R. Heermaneck, Bombay 7. Consolation Prizes: I. W. Saunders, Quebec, Canada: R. G. B. Coulam, Auckland, W.1, N.Z.

Famous Yachts and Racing Thrills—

(*Continued from page 321*)

decided that this error should not disqualify her.

Since that time almost countless sums have been spent by British yachting enthusiasts in an effort to bring the cup back to Britain. It is estimated that at least £3,000,000 has been swallowed up in this way. One of the biggest of these attempts was made in 1937 by Mr. T. O. M. Sopwith, the famous aircraft manufacturer. He is reputed to have spent £100,000 in designing and building the "Endeavour II" as a new challenger for the trophy. This vessel must be regarded as perhaps the most carefully constructed racing yacht ever built. She was given a hull of rolled steel, with plates of special type enabling them to be polished. Her 168 ft. mast was made of the same kind of metal, and was fashioned in sections to resemble the construction of a bamboo cane.

This year Britain's racing yachtsmen will be largely "feeling their way" at Cowes, after seven years' suspension of yachting contests. But the thoughts of many will be towards the further development of this thrilling sport, with the hope that the Royal Yacht Squadron Cup, the official title of the "America's Cup," may be won back for Britain at some not very distant date.

The Flight of the Bat— (*Cont. from page 322*)

both in speed and in ability to manoeuvre. Vesey-Fitzgerald, the greatest bat expert in England, writes: "A bat is quite capable of reversing its direction in its own length, quite capable of turning a right angle within the space of a few inches while travelling at full speed, feats which no bird can attempt but which are commonplace to bats." Many naturalists have reported seeing bats race swifts to their food in the air and beat them to it.

Young bats require no flying lessons, as do birds, and whereas birds and aeroplanes take off into the wind, bats appear able to take off down wind and thereby gain immediate speed. In many modern aircraft designs the body or fuselage is becoming shorter and embodied in the streamline of the wings; it is interesting to note that the bat's body is short and is closely contained in the wing webbing.

Wild Life Down Under—(*Cont. from page 329*)

the bush. The golden bower-bird, which is found in North Queensland, is specially interesting, for in addition to its nest it makes a large play hall in which courtship is mainly conducted. First of all the bird selects a couple of trees standing a little distance apart, and then it builds a pyramid-like structure of sticks and twigs around the base of each. After this it joins these columns together by an arch constructed from the stems of jungle creepers. Lastly, the walls are decorated with orchids and other flowers, as well as pieces of moss and bunches of bright berries.

Australia, as befitting the largest island in the world, has nature wonders of its own, and those of us who have been fortunate enough to see some of them in their native haunts look forward to the day when their beauties can be revealed to an even larger public.

L.N.W.R. Models of Bygone Days—

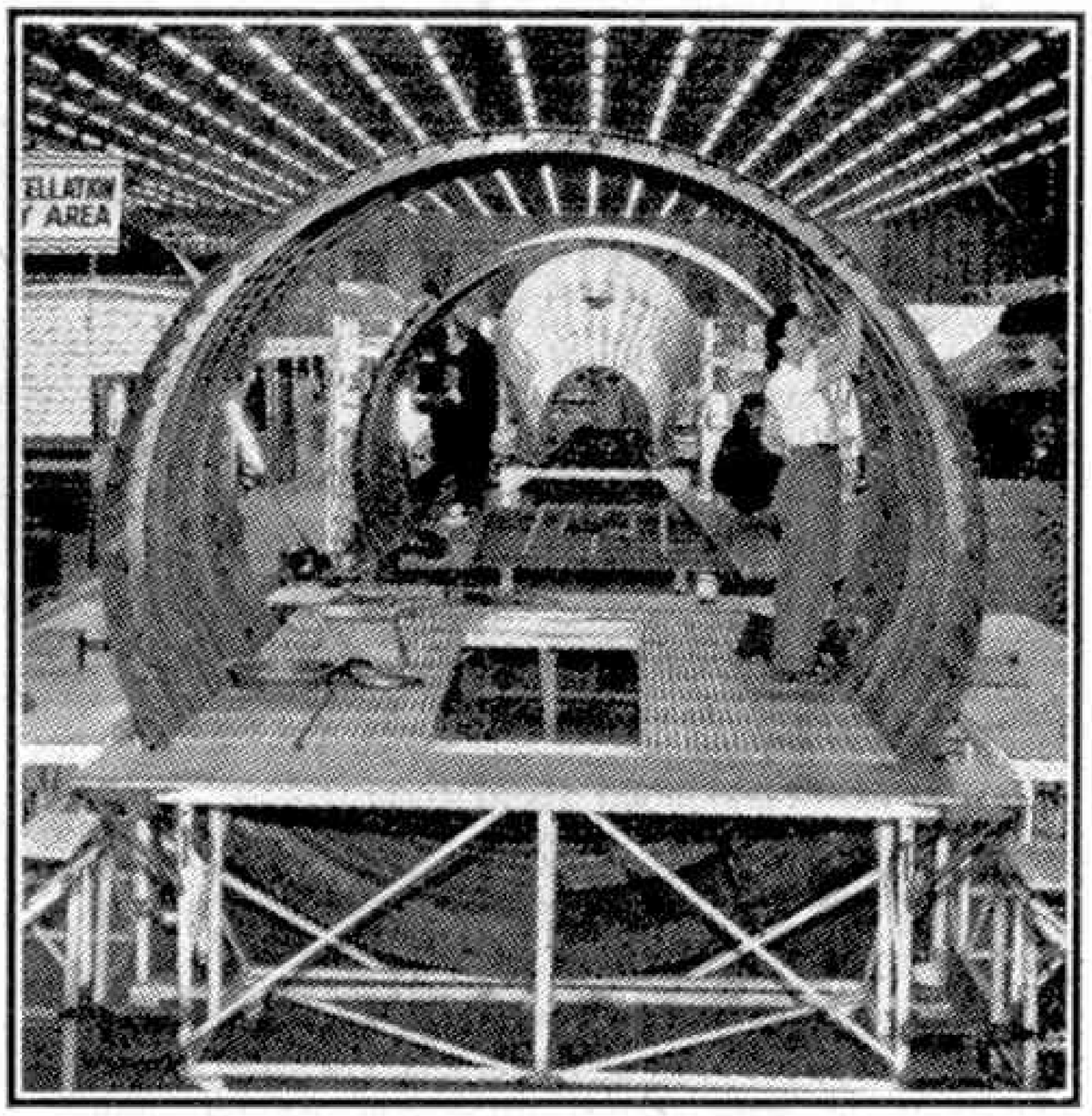
(*Cont. from page 341*)

captures successfully the general lines of the real class, certain features are rather exaggerated. One such detail that has been removed and replaced by a neater fitting shown in the illustration was the original smoke-box handle and wheel; an enormous gadget, beautifully made with tapered handle, but big enough for a model twice the size. Similarly the original dummy whistle on the cab roof was much more suggestive of a factory hooter, and this too has been done away with.

The tender is quite an attractive vehicle and closely resembles the real thing with its rounded tank corners, and coal rails. A fascinating little refinement is that the lids of the tender tool boxes are hinged to open.

An American Chime Whistle at Crewe

When the L.M.S. "*Coronation Scot*" train visited the United States in 1939 American model railway enthusiasts presented it with a characteristic American chime whistle, a type in which several notes are sounded tŏgether to produce an arresting yet harmonious tone. This was engraved with the inscription "*Presented at Chicago, U.S.A., April 2, 1939, as a gesture of good-will from American model railroaders to their British friends.*" If the whistle were installed in the usual place on a modern British engine it would not safely clear all bridges and tunnels, so the L.M.S. have put it to use as a works hooter at Crewe, a job for which its robust tones make it very suitable.



Assembling some of the eight sections that make up the complete fuselage of a "Constellation" transport. An ingenious fixture permits an entire section to be rotated around the stationary flooring to give workers access to any part of the assembly without unnecessary reaching or stooping. Photograph by courtesy of the Lockheed Aircraft Corporation, U.S.A.

The 1946 "Model Engineer" Exhibition

The Annual Exhibition organised by "*The Model Engineer*" will this year celebrate its 21st birthday, and a record show is promised. It will be held in the New Hall of The Royal Horticultural Society at Vincent Square, Westminster, London S.W.1, from 22nd to 31st August, from 11 a.m. to 9 p.m. each day, Sunday excepted. The usual Competition section for the Championship Cups and medals and other prizes will feature a splendid array of models, and the loan section also will contain many interesting exhibits. The Society of Model and Experimental Engineers will have its passenger-carrying railway track in daily operation, and the Society of Aeronautical Engineers will arrange demonstrations of captive planes in flight and a display of models of the latest types of aircraft, of all kinds.

Fireside Fun

"Johnson took three wickets in three balls, knocking down a different stump each time but never hitting the leg wicket."

"Nonsense. It couldn't be done, as there are only three wickets to hit."

"Wrong. The last of the batsmen was a left-hander."

* * * *

"I've brought this week's rent, landlord, and that makes me square."

"H'm, yes, but you had better be round again next week."

* * * *

"Why are you late for school?"

"Please, miss, I swallowed a piece of wool."

"H'm. Just another fine yarn, I suppose."

* * * *

"Now can you spell 'ham'?"

"Well, do you mean the 'am you eat or the am you is?"

* * * *

"Don't go near the pantry, Johnny. There's a ghost in it."

"Oh, is there. Then why don't you blame the ghost for those tarts that were missing yesterday?"

* * * *

"Waiter, I can't eat this food. Fetch the manager."

"That's no use, sir. He can't eat it, either."

* * * *

"Jones, what is the difference between the North and South Poles?"

"I can't say exactly, sir, but I believe there's a world of difference between them."

* * * *

"Are you coming out to play, Jimmie?"

"No, I've got to stay in and help Dad with my homework."

* * * *

"Hi, there, your wretched pup has broken through the hedge and damaged all my dahlias."

"Well, there's nothing remarkable in that. If your dahlias had broken through the hedge and damaged my dog it would have been worth making a song about."

* * * *

THIS MONTH'S HOWLER

False doctrine means bad medicine.

BRAIN TEASERS

A HOLIDAY PUZZLE

Sums in which letters represent figures, or from which figures are omitted, are very popular with readers of the "*M.M.* judging by the number sent in to me. Here is one of these, an easy one for the holiday month:

```
215)x7x9x(1xx
     xxx
     ---
     x5x9
     x5xx
     ----
      x4x
      xxx
      ---
```

Each x represents a missing figure. Can you fill these in?

B.A.

* * * *

"That's the wrong one!"

"It's all right. I'm coming to it."

* * * *

MORE EESY WORK

Each horizontal line of the square given below is to be fitted with a different five-letter word. In these words all the vowels are e's, in the positions indicated in the square, and in addition each word begins with the same letter. Can you find suitable words? Choose your own initial letter.

	E		E	
	E	E		
		E		
		E	E	
	E		E	

YOU MUST READ THIS

For our third puzzle we have a very simple but ingenious code that may prove baffling. A message of the greatest importance to every reader of this column is hidden in the assembly of letters given below. What is the message?

TERERTCE	OWDTOHOT	RRETUINH
EIREPSDI	ATTRAWLR	DEHSNIED
TDEODTTA	HOFFFHTN	IWIEOTED
SNRALHRS	CISCLESO	ONTHOSTO
DOLGWEHN		

A.M.M.

* * * *

SOLUTIONS TO LAST MONTH'S PUZZLES

The solution to our first problem last month is as follows:

```
3521)56336(16
3521
-----
21126
21126
-----
```

The key word will be seen to be "AUTHOR." Actually the key word is more easily found than the figures, and a hint that the problem should be solved in this way was given in the heading.

The 10 words of our "Step by Step" puzzle are Arena, Nadir, Irate, Tease, Sedge, Genus, Usher, Erica, Carse and Sever.

The five B.B.C. programme features in the jumbled puzzle are "*Brains Trust*," "*Just William*," "*Music Hall*," "*Music Cavalcade*" and "*Family Favourites*."

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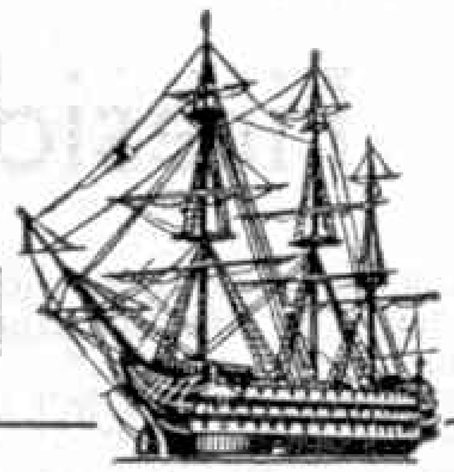

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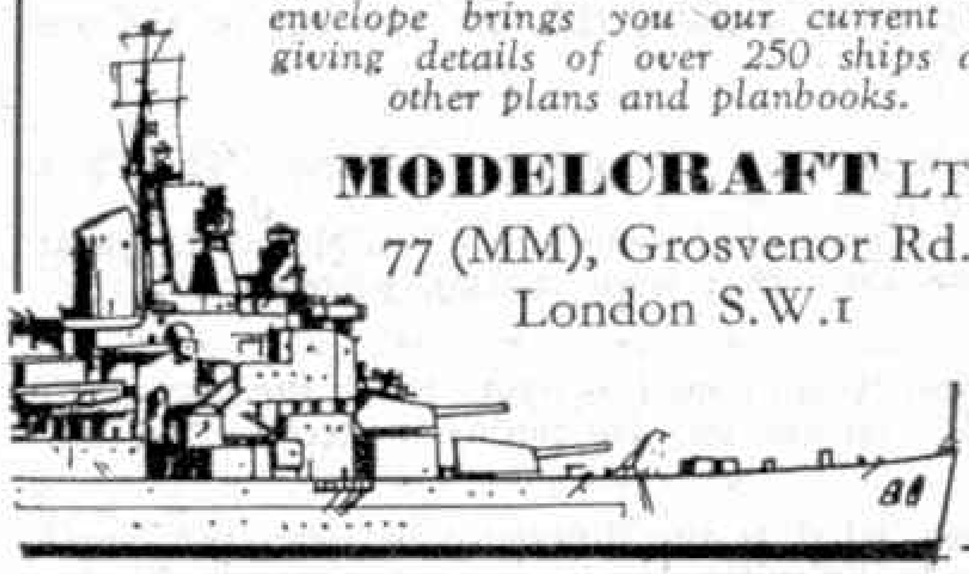

W·i·l·l·i·a·m!

"All right, Mother— I'm coming — on my"
Hercules

says 'William' (John Clark) of
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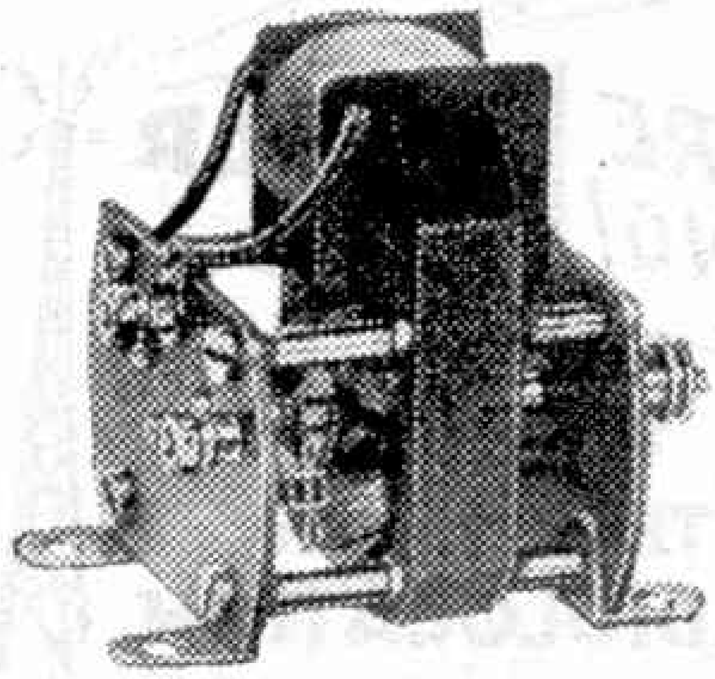

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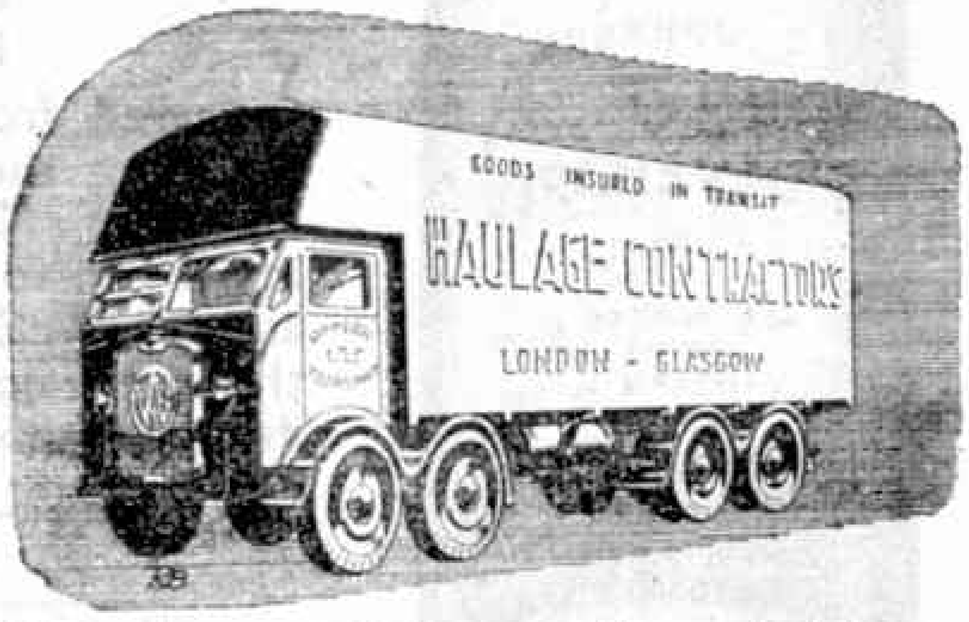

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(See also pages 342 and 344)

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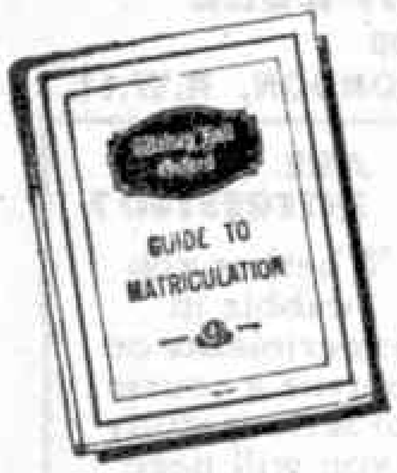

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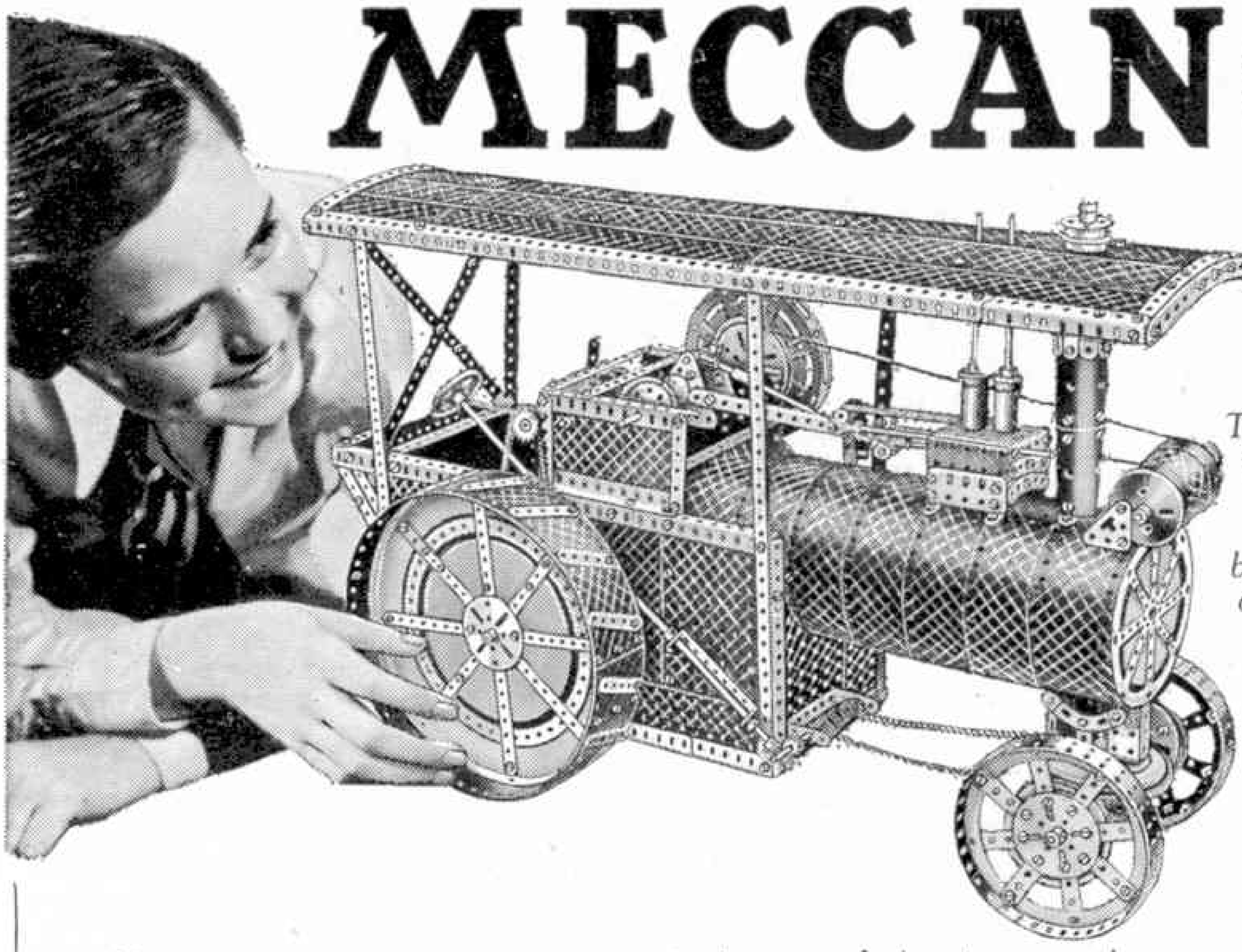

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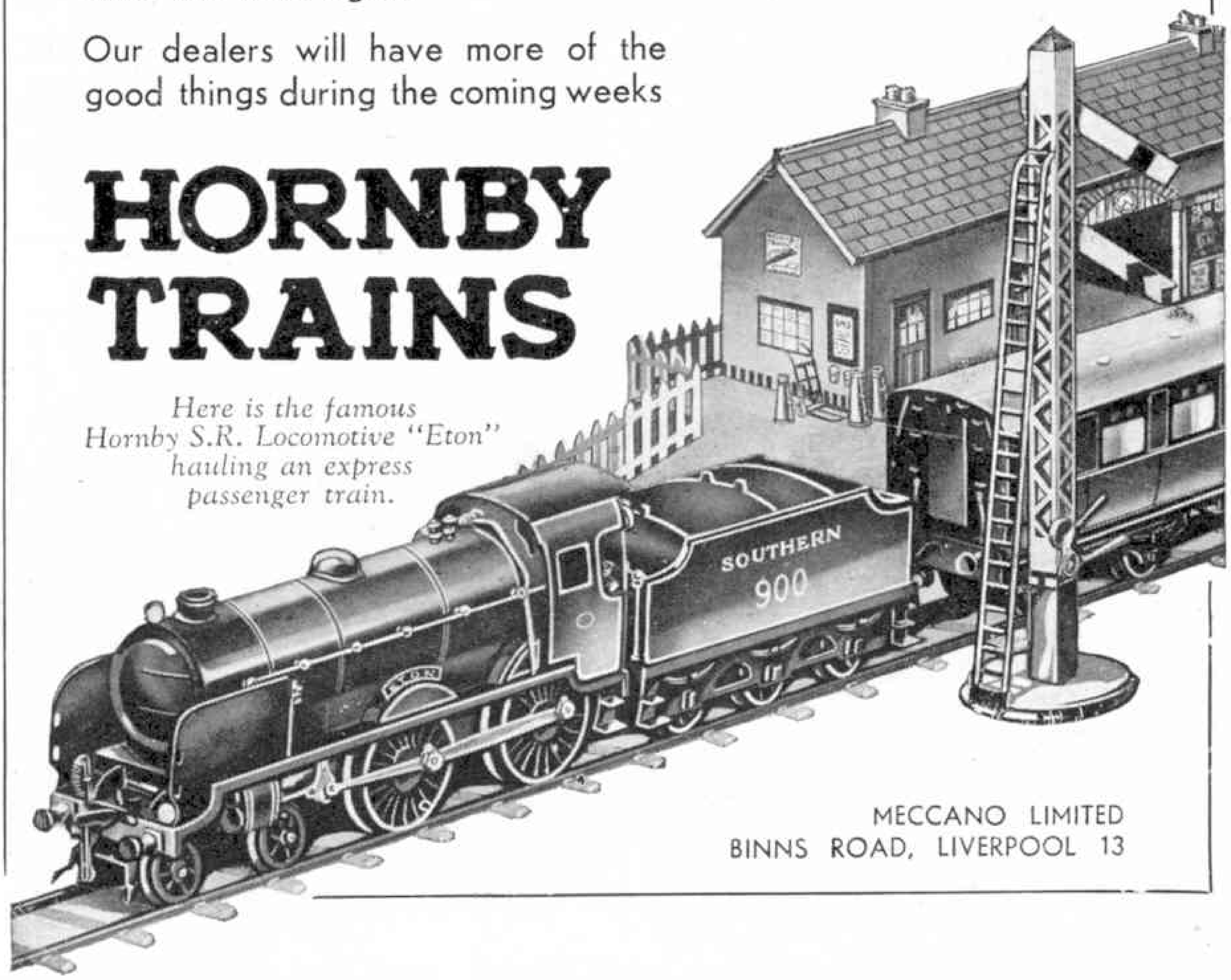

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